S588

JULY 1962

Soil Conservation

SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE

VOL. XXVII, NO. 12 JULY 1962

Growth Through Agricultural Progress

Soil Conservation 25 Years Ago

"The cultivator who possesses the art of good cultivation together with a knowledge of the facts demonstrated by soil scientists is the real soil builder. He recognizes the fertile soil as a living complex and not an inert mass; the boundary between death or decay of one generation of plants in the soil and the life of another springing out of it, is very narrow. He strives to maintain and, if possible, to increase the vitality of the soil of which he has charge."

•

"In planning for research and establishing erosion-control works, South Africa has recognized the similarity between environment in that country and in sections of the Great Plains of the United States and has utilized the results of our experience. Similarly, their experience may serve as a check on our procedure, suggest other methods for erosion control, and indicate new lines of researen."

CONTENTS

PAGE		
267	Conservation Education In Classroom and Afield	*By Donald A. Wilbiams*
268	Teaching Teachers Resource Conservation	*By Raymond S. Brown*
269	Star Farmer Schooled in Conservation	*By Leon J. Sisk*
271	2,000 North Dakota Teachers Study Conservation	*By Charles A. Evans*
272	10 Million Young Conservationists	*By Shirley Miller*
273	Teacher Conservation Institutes	*By David O. Davis*
275	"We Pledge Ourselves"	*By John C. Beard*
276	Boy Scout Nature Museum Conservation Classroom	*By Ted S. Pettit*
278	Milwaukee Schools Go For Conservation Teaching	*By Marvin Schweers*
279	Conservation Teaching Geared To Community Life	*By Arthur W. Emerson*
281	Kids' Cartoons Liven Conservation Interest	*By James L. Woodard and Louis J. Dondero*
282	A Woman's Way In Conservation Education	*By Milton E. Bliss*
284	From Backyard Garden To Conservation Truck Farm	*By Marvin F. Bureau*
285	Conservation Increased Through Conservation Teaching	*By Gene F. Bohnenblust and Danield E. Holmes*
287	TV Brings Conservation Into Tennessee Classrooms	*By Grace Batson*
288	Our Job and Yours	*By George A. Selke*

COVER PICTURE—All over the country school youngsters like these visiting the Guerdon Reed, Jr., farm in Grant County, Wis., are taken by their teachers to learn about conservation farming first hand. (Photo by E. W. Cole.)

Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, June 26, 1958.

FRANK B. HARPER, Editor

15 CENTS PER COPY $1.50 PER YEAR

FOREIGN—$2.25 PER YEAR

25 percent discount on orders of 100 or more mailed to one address.

All orders for paid subscriptions go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Conservation Education

In the Classroom and Afield

By **Donald A. Williams**

RESPONSIBILITY for soil and water and related resource conservation bears more heavily on every succeeding generation as our population mounts, and our land and water problems multiply. Thus it is the sober obligation of the current generation to prepare the next so well that it will discharge its conservation responsibilities more wisely and effectively than any of its predecessors.

That means instilling in today's young people a basic understanding of what these life-supporting resources are, a true appreciation of their real values, and some practical knowledge of conservation principles and actions.

The first step is to teach conservation in the Nation's classrooms, from kindergarten through college. Incorporating conservation subjects in the school curriculum at any level is appropriate; for soil, water, plant, and wildlife conservation is part and parcel of conventional subjects such as elementary science, biology, nature study, geography, health and nutrition, and other sciences and social studies.

To confine teaching an "agricultural" subject such as soil and water conservation to rural areas no longer suffices. The conservation and wise use of these and allied natural resources affects every one of our 186 million people —from the farmer and rancher who produces our food and fiber crops to the youngest city consumer of milk from his nursing bottle. It equally concerns the fast-growing ranks of rurban and other land users and city people who must have ample water for household, industrial, and recreational uses.

Fortunately for the soil and water conservation movement, resource use and conservation has come to be recognized in its proper perspective by thousands of teachers and other educators. For they, more than anyone else, will shape the attitudes of tomorrow's generations toward the renewable natural resources by which we live. Many science and social studies teachers and others have found they can strengthen the subject content of their courses by relating them to local resources, their use, and conservation. Many more should do so if our ever-improving conservation technologies are to be applied to the fullest needed extent.

Conservation education has made great forward strides. There is increasing conservation preparation in teacher training colleges. More than 100 conservation workshops are held each summer for teachers. A growing variety of classroom texts and other materials on natural resources and conservation are becoming available to teachers and students.

About 20 colleges and universities now offer undergraduate degrees with soil and water conservation majors. Thirty-one States have conservation advisory committees or councils, on which State departments of education, colleges, and universities usually are represented.

Formal resource education in schools also is supplemented substantially by educational activities of the Federal-State Extension Services, Forest Service, and by conservation programs in school-age youth organizations such as the Boy and Girl Scouts, Camp Fire Girls, Junior Audubon Clubs, Future Farmers of America, and 4-H Clubs. These major youth groups alone include more than 11 million boys and girls from farms and cities, plus several million dedicated adult leaders.

The Soil Conservation Service provides information on soil and water conservation to all of these educational interests and youth groups, and to textbook writers and producers of other educational materials. It also similarly serves organizations such as the Conservation Education Association, National Science Teachers Association, American Association of School Administrators, Joint Council on Economic Education, American Nature Study Society, and the National Association of Biology Teachers. It works with specialists of the U. S. Office of Education on conservation teaching materials.

The SCS is not in the teaching business, any more than it is in the farming business; but, just as providing technical help to land users is our responsibility, so is providing aid to conservation education our responsibility. This assistance ranges from supplying teachers with requested basic conservation information to participating in field tours for school and youth groups.

The Soil Conservation Service holds conservation education to be of highest importance, for only a conservation-minded people can safeguard and improve our remaining heritage of renewable natural resources in the future.

Robert R. Finlay.

Teaching Teachers To Teach Resource Conservation

By Raymond S. Brown

RESOURCE conservation education in Ohio has made pacesetting studies during the last decade because of a successful program of teaching elementary and high school teachers how to teach this live subject.

It was in 1952 that the State Department of Education added a supervisor of conservation education to its staff—the first such full-time position in the entire country. Today, a half-dozen or fewer States yet have a counterpart to the Ohio position, occupied from the outset by native born Ohioan, and Ontario outland-reared Bob Finlay. In the intervening 10 years, he has worked with more than 11,000 Ohio teachers—through outdoor workshops, meetings, and personal visits. His office now mails out about a quarter of a million pieces of resource conservation teaching material a year.

"Get resource education into the State's schools any way you can," was Finlay's assignment. He began by working out educational projects for teachers with the aid of information supplied by local Soil Conservation Service technicians, county Extension agents, game protectors, and school board members.

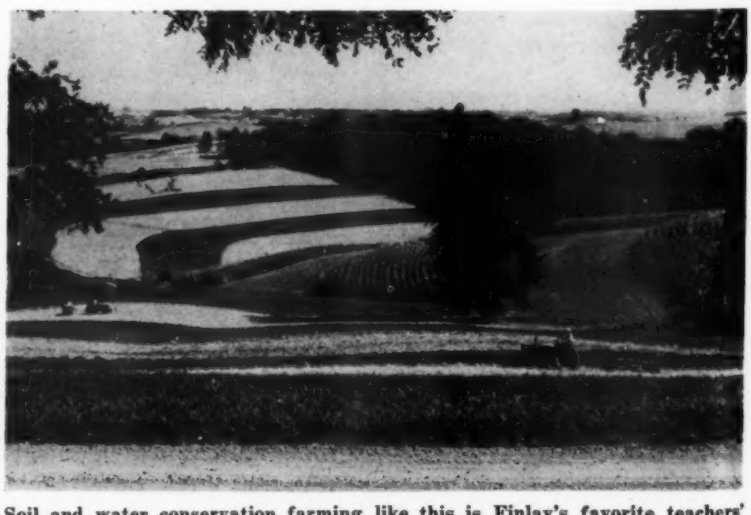
Finlay has found the county outdoor workshop to be the most effective device he has used with "at least 80 percent of the teachers" agreeing with him. He plans these outdoor workshops around whatever is important in the part of the State involved. It usually is soil and water conservation on farms; but it may be strip mining, a watershed project, or rurbanization. When a workshop is held on a farm, Finlay tries to pick one that has a good soil and water conservation program, a pond developed for wildlife and recreation, and other effective and up-to-date measures.

Outdoor workshops usually include key points such as watershed dams, terraces, waterways, woodland-improvement areas, and wildlife developments. The time-tested "hayfield limousine"—a hay rack with bales of hay for seats—takes the teachers from stop to stop. A technician is on hand to explain the problem and its solution.

"The teachers learn the practical economic implications of conservation, facts often omitted from textbooks," Finlay says. "Their first reaction to strip mining was that it should be forbidden. They were quick to modify this view when they learned how jobs, business, even schools would be affected."

Not all teacher workshops are held outdoors. In some counties, the teachers hold an annual all-day institute devoted to conservation of natural resources. One held last fall under the cosponsorship of the Summit Soil Conservation District and the Summit County Teachers Association is typical.

The feature event was an address



Soil and water conservation farming like this is Finlay's favorite teachers' outdoor workshop subject.

Note:—The author is State conservationist, Soil Conservation Service, Columbus, Ohio.

Finlay explains tree growth to teachers during outdoor workshop.

by Dr. Roscoe H. Eckleberry, retired editor and professor of education at Ohio State University, and a member of the Ohio Conservation Laboratory staff for more than 20 years. Some 1,000 elementary and high school teachers also studied exhibits on conservation and displays of teaching materials. Many brought displays from their own schools.

What help do teachers want most in teaching conservation education? Finlay called a group of school administrators together and came up with this answer. Charts of basic concepts, lesson outlines to follow, and visual aids. In a project to produce such materials, teams composed of one technician and one educator worked on various subjects. The Ohio Forestry Association obtained a grant from a group of Ohio utilities to finance the project. The Natural Resources Institute of Ohio State University supported the project and helped prepare the materials. SCS and Forest Service technicians served on the teams.

These teaching aids began to roll off the production line in 1958. During that year Finlay's office mailed 11,000 charts to Ohio's teachers. "A Guide to Teaching Conservation in Ohio's Elementary Schools" came next—10,000 copies went to the teachers in 1960. This comprehensive booklet has become the "conservation teacher's Bible." In 1962, about 500 sets of film strips with notes in guidebook form will be distributed.

Finlay also is a product of Glen Helen outdoor conservation laboratory at Antioch College near Xenia, world famous outdoor classroom that will be the site of the Ohio Conservation Laboratory in 1963. Finlay is assistant to Carl S. Johnson, director of the Ohio Conservation Laboratory and associate professor of conservation at Ohio State University.

Finlay received the 1961 "Professional Excellence Award" from the All-Ohio Chapter of the Soil Conservation Society of America.

"The most pressing need," Finlay says of what's ahead in conservation education, "is to get conservation courses in the colleges. We've got to sell more professors on conservation. We've got to train more teachers in conservation. It should be considered as fundamental as the teaching of English."

Star Farmer of America

Schooled in Conservation

By Leon J. Sisk

MEET James Isaac Messler—1961 Star Farmer of America and Conservationist.

Before he was 20, the tall, blond farm youth, who lives near Greenback, Tenn., had parlayed his original "grubstake" of a calf given him by his grandfather when he was only 5 years old to a 45-cow herd of registered Holsteins, bought and paid for a 193-acre farm, and boosted his net worth deep into the 5-figure column.

His Star Farmer award was won in competition with 400,000 others in the 50 States and Puerto Rico. A member of his high school soil judging and dairy judging teams, James Isaac went on to pile up more conservation and other awards, such as the 1957 State dairy award, 1958 Star Farmer in Tennessee, and in 1959 the FFA-SCD State soil and water conservation management award.

How has this young man accumulated in a few years more than most farmers do in a lifetime? A burning desire to be a farmer; the good example set by his father, C. L. Messler; the inspiration of his vo-ag instructor, Bruce Hinton; the encouragement and help of the

Young Messler plans for the future of his farm.

Note:—The author is field information specialist, Soil Conservation Service, Spartanburg, S. C.

Soil Conservation Service technicians—all have been factors in young Messler's successful career. That is to say nothing of the fact that he worked for a time with the SCS as an aid.

Conservation education has undoubtedly been an important factor in James Isaac's starred career. For him, farming was always more fascinating than football, and cows and conservation of more interest than hot rods and the other teenager activities.

Like father, like son, could be another reason for his success. His father is highly respected in the community for his progressive farming methods. He owns a productive 200-acre farm, and has been a district supervisor ever since the Loudon County Soil Conservation District was established in 1956.

And because James Isaac respects his father's leadership in conservation, one of the first things he did when he bought his farm in 1959 was to get his vo-ag teacher and the SCS to help him develop a conservation plan for it. The farm was strictly a "rabbit farm." The land was hilly and rocky, eroded easily, and was badly gullied and rundown. It had been overcropped, planted to corn every year, and was in "bad shape," in the words of the local SCS technician.

But walk over it today, and you'll see contour striperopping, grassed waterways, young pines growing on rough, gullied areas, permanent pastures, alfalfa for hay, rotation cropland, and a farm pond for livestock water and fishing.

The United States' 1961 Star Farmer has a diversified farming operation, with major emphasis on dairying. His 35 milkers produce an annual average of 11,100 pounds of milk and 425 pounds of butterfat, as compared to the State average of about 8,000 pounds of milk. He also finishes out about 100 feeder pigs a year.

Young Messler paid less than $14,000 for the farm. The county tax assessors recently re-appraised it at $21,000. In March 1962, he bought another 50 acres to bring his total acreage up to 243. He also owns the up-to-date farming and milking equipment needed in his operations.

James Isaac has on his own initiative put to use a lot of ideas he picked up while working with the SCS. His vo-ag instructor gives this experience much credit for the conservation improvements young Messler has made on the farm, though in his senior year in vo-ag he majored in the study of soil and water conservation. That was when he got the SCS job, because, as he says, "I thought I could learn something I could use."

James Isaac's father suggests a site for his future home.

"James Isaac was the most curious and industrious aid I've ever had," SCS Work Unit Conservationist Thelbert Hicks recalls. "He helped with engineering surveys of farm ponds, drainage ditches, contour striperopping, terraces, contour lines, and grassed waterways. He also helped to supervise the construction of these and other practices. And when he didn't have fieldwork to do, he was working with aerial photographs, or coloring soil and capability maps. He was dead set that he was going to learn everything he could about soil and water conservation."

It all has paid off for Star Conservation farmer James Isaac Messler.

◆

Dr. George Blume of Virginia Polytechnic Institute reports that Virginia in 1960 was officially classified as more urban than rural, with 56 percent of its citizens in the urban grouping.

Star Farmer with prize herd of high-producing Holsteins.

2,000 North Dakota Teachers Study Conservation

By Charles A. Evans

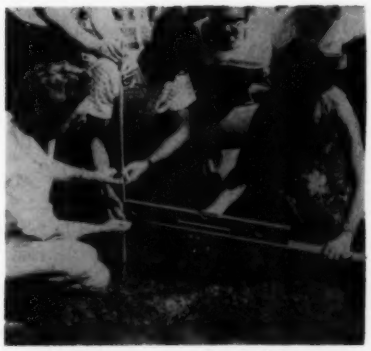
THIS is the 11th anniversary of North Dakota's State Conservation Training Center at the Ritchie Memorial Camp on the shore of Lake Ashtabula near Valley City. More than 2,000 teachers have studied at the Center.

Beginning with two 1-week sessions in 1952, the Center now operates summerlong. Seven weeks are devoted to the presentation of five college-credit courses. Three of these courses are on the use and conservation of natural resources: Soil, water, and minerals; plants and conservation; and wildlife conservation and management. The teachers may take the courses in one full summer session or, as many do, one unit each summer for several years. In addition, two courses of 2 weeks each in art and science for elementary teachers are offered. All courses at the Center are supplemented with out-of-door study and experiences to increase teacher efficiency in using local environments for their teaching purposes.

At other times, the facilities are used for conferences of groups interested in conservation, like the North Dakota Association of Soil Conservation Districts, ministerial associations, and college faculties.

The idea for the Center grew out of the practice, begun in 1949 by Marvin A. Leraas, of holding summer conservation biology courses in the camp at Lake Ashtabula. Leraas, professor of biology at the North Dakota State Teachers College in Valley City, has been director of the Center since it started.

Possibilities for teaching conservation in an outdoor environment and its appeal to teachers soon became apparent. Financial help to lease an area of lakeshore land and improve the site came from North Dakota soil conservation districts and the North Dakota Wildlife Federation. Supervisors of the Barnes County Soil Conservation District leased the area, and serve as the managing board for the camp. More financial help came later from the State Game and Fish Department, the State Soil Conservation Committee, and the North Dakota Legislature.



Teachers measure a slope with a yardstick, spirit level, and board.

Other agencies help with program planning, laboratory, and field instruction. They include colleges, the Soil Conservation Service, Bureau of Reclamation, Fish and Wildlife Service, and State agencies such as the Geological Survey, Water Conservation Commission, Extension Service, and Game and Fish Department.

Beginning with tents and campfires, the Conservation Center now has nine buildings and numerous recreational facilities.

North Dakota Conservation Training Center is in a setting of the subjects of its conservation courses.

Note:—The author is assistant State conservationist, Soil Conservation Service, Bismarck, N. Dak.

10 Million Young Conservationists

By Shirley Miller

"CONSERVATION is what we eat and what we wear and where we live, and if we don't, we won't."

This classic definition of conservation was written by a 9-year-old from New Hampshire in one of the up to 300 letters at a time received by the Audubon Junior Department of the National Audubon Society from young conservationists from coast to coast. He is one of more than 10 million youngsters, who in the half a century since 1910, through their affiliation with the Audubon Junior Program, have discovered the importance of our soil and water, our plants and wildlife. Many leading conservationists today may date their active interest in this subject to membership in an Audubon Junior Club.

From their multiplying ranks and growing enthusiasm, it seems apparent that conservation today is absorbing the interest of a large segment of our younger generation. Each year, the number of groups subscribing for this program tops the preceding year's figure. Enrollment for the 1961-62 year exceeded that of 1960-61 by 54 percent.

The materials provided by the Audubon Junior Program stress the relationship of all life on this planet, and establish a focal point for a wide variety of conservation learnings. They lay a solid foundation for more advanced scientific study in many fields. They also help a child gain a better understanding of himself—of his skills and abilities—and call attention to his responsibilities as a citizen of his country. Most important of all, they arouse appreciation of the beauty and value of the world we live in and encourage a desire to protect and conserve these values.

Conservation scrapbooks fascinate pupils in Dawson County, Nebr., Middle No. 29 School.

An example of the learnings children gain about soil conservation received recently at Audubon House was a jumbo-sized scrapbook entitled "Our Conservation Book." It was produced by the third-grade Audubon Junior Club in the Barge-Lincoln School, Yakima, Wash. In it these children had combined a term-long study of soil and water conservation with other subjects. Each of the 35 8-year-olds had contributed an illustrated essay, covering such subjects as "What Makes Soil," "How Soil and Water Help," "What Soil Needs For Growing Crops," "How Soil Is Made and Used," and "We Need Soil and Water."

Each year this program emphasizes one specific topic as a focal point for conservation and natural science learnings, such as trees, birds, insects, soil and water, mammals, and flowers. However, each topic stresses the relationship of that subject to the world around it. Conservation concepts are achieved by a host of creative projects and

Barge-Lincoln School third graders are proud of plants they grew.

Note:—The author is director, Audubon Junior Program, National Audubon Society, New York, N. Y.

Children get close to Nature at Minnesota Braille and Sight-Saving School.

Irrigation farming in the Yakima Valley.

activities that are documented in detail. Materials for this topic are available at the opening of the school year.

Each child in an Audubon Junior Club—a group of 10 or more children plus their leader—receives a book, illustrated in color, on the specific topic of the year. He also receives a colored pin, certifying that he is a Junior Member of the National Audubon Society.

The conservation and natural science materials the Audubon Junior Program provides are easily integrated with all areas of the elementary school curriculum. In addition, each year thousands of Scout troops, Camp Fire Girls, 4-H Clubs, religious youth groups, and summer camps use these materials to implement their own conservation and nature programs. There also are hundreds of neighborhood Audubon Junior Clubs that flourish in their own right.

One of the most active groups in the country is comprised of children in the Minnesota Braille and Sight-Saving School in Faribault, Minn. For more than a decade, Mrs. Charles MacKenzie has used the Audubon Junior Program as a basis for her inspired conservation and nature teachings with these blind children. They know birds by their songs and calls, trees by touch, flowers by odor. They can analyze quickly a handful of soil by the "feel."

So it is that from Illinois, California, and Texas, from Puget Sound to Chesapeake Bay, young conservationists are in the making the Audubon Junior Program way.

Teacher Conservation Institutes

Bring County People Together

By David O. Davis

IF you look for reasons for the spread of soil and water conservation teaching in Nebraska schools you're sure to give a large measure of credit to the County Teacher Conservation Institutes.

More than 2,200 teachers have attended the 53 summer institutes held during the last 4 years, including 11 in 1961. An institute runs 2 days. Arrangements are made jointly by the county school superintendent and soil and water conservation district supervisors.

Institutes are held in three adjoining counties at the same time. A team of speakers on various phases of soil and water conservation works in three rotating units. District supervisors take turns as chairmen. Field trips are made the final afternoon.

County people taking part in the programs include, besides the farmers and teachers, bankers, merchants, and personnel of the Soil Conservation Service and other State and Federal agencies headquartered there. They give the teachers the details of the conservation job going on in their own county. Their participation gives local focus to the broad picture presented by the traveling team. It also provides time for the traveling units to move from one county to another—especially between the first-day morning and afternoon sessions.

Note:—The author is field information specialist, Soil Conservation Service, Denver, Colo.

The idea of the institutes hatched in a meeting called in January 1958 by Warren Fairchild, executive secretary of the Nebraska Soil and Water Conservation Commission. Present were representatives of the State Department of Education, State Normal Board, Agricultural Extension Service; the Game, Forestation and Parks Commission, Forest Service, Doane College, and the Nebraska Association of Soil and Water Conservation Districts.

This group saw in the institute idea a way to give teachers an understanding of the problems and action involved in this conservation movement, as well as information for the teachers needed to create a desire among children for conservation instruction.

The Nuckolls County school superintendent held the first conservation institute in 1958. At the past rate of the institutes' spread, one will have been held in every Nebraska county by the end of 1963. Then they start over with a followup program. Among conservation leaders prominently identified with this outstanding teacher training method has been Miss Ivah Green, formerly professor of education at Doane College, a longtime director of conservation workshops, and author of articles and teaching aids on the subject.

Institutes can best be held only during the 20 days between the end of summer school and the beginning of the fall term. The schedule of the traveling speaker team accordingly is extraordinarily tight. Its average is 18 counties a year.

"Conservation Teaching Methods" exhibits studied at a County Teacher Conservation Institute.

Topics for the traveling speaker team this past year were: Importance of conservation, soil conservation demonstrations, woodland management, wildlife management, water, conservation teaching methods, and how to integrate soil and water conservation teaching in the school.

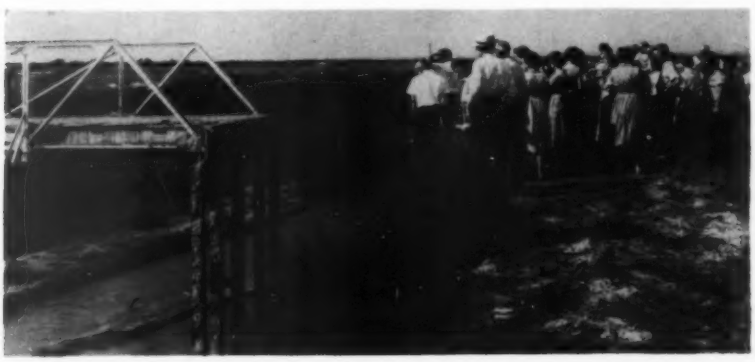
Topics offered by local people vary. For example, the Scottsbluff County Institute included conservation needs, the Gering Valley watershed protection project, and accomplishing conservation goals.

Fairchild estimates that the teachers attending the institutes have passed their gleanings on conservation to at least 11,000 families.

"I always thought conservation to be a dull dry subject," one teacher remarked. "You have made it seem gay, and fun."

Another said: "With all the help and encouragement I've received here, I know I'll be able to teach conservation and make it stick in my pupils' minds."

A county sueprintendent observed: "Conservation has been studied for years in our schools, but at this institute many practical things were provided which can be taken home and used." Another reported after an institute was held in his county that "As I visit schools I find the teachers are doing a fine job of weaving conservation into our course of study."



Teachers see for themselves what floodwater can do to a road and bridge.

Teach our children to love and protect the soil—and you've invested in soil conservation for the future.

"We Pledge Ourselves"

By John C. Beard

SUPERVISORS of the Southmost Soil Conservation District in the Lower Rio Grande Valley of Texas consider their work with schools a most important part of their responsibility of using every practical means of encouraging a total conservation program.

Teaching conservation in the public schools is the No. 1 item in a pledge appearing on all of the printed programs for district-sponsored activities—to accent their responsibilities. The pledge:

"We pledge our time and energy to the strengthening of a complete conservation program by (1) recommending and urging that conservation be taught in our public schools as a planned part of the curriculum, by (2) making sure that an active and continuous research program is conducted to solve the soil and water conservation problems in our district, and by (3) assisting in the ready application of proven, new or improved, techniques for getting the conservation job done on the land."

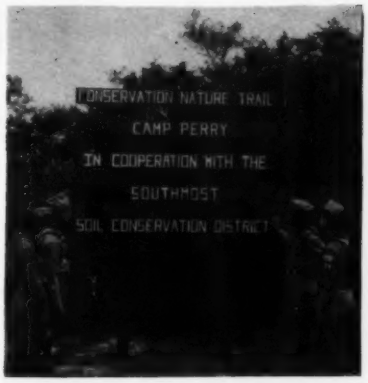
Note:—The author is work unit conservationist, Soil Conservation Service, San Benito, Tex.

With a major emphasis on their work with the schools, the idea of "Teach Our Youth What Is Right With Conservation" has been accelerated. The supervisors know that many times the lessons of conservation teaching that the parents otherwise would not hear reach the ears of adults from the mouths of children.

Teaching conservation in the schools has been approached in several ways. The most successful methods from the district supervisors' standpoint have been field trips, along with essay and poster contests to supplement classroom teaching in stimulating parents' and community interest. During the 1960-61 school year alone, more than 300 5th grade students from 6 different schools took the district conservation tour. The supervisors themselves conducted these tours.

More schools are becoming interested in these activities each year. Related district activities include work with Boy Scouts, and field days held for farmers. The application of conservation practices in the district has increased steadily, indicating the supervisors' educational efforts are paying off.

A typical soil and water conservation tour by school pupils.



Entrance to conservation nature trail at Boy Scouts of America summer camp.

Between 1959 and 1961, the district won five State awards and several regional awards. The top prize for all districts in Texas was won by the Southmost district in 1960, when the supervisors furnished the leadership that won the title "Outstanding District" in the Fort Worth Press Conservation Awards Program.

◆

Land-Grant institutions, although numbering fewer than 4 percent of the Nation's colleges, enroll about 20 percent of all U. S. undergraduate students and grant nearly 40 percent of all doctoral degrees.

◆

USDA's Agricultural Research Service Western Utilization Research and Development Division at Albany, Calif., has developed a whole-grain, 84-calorie wheat wafer as a compact, long-keeping emergency ration for stockpiling in fallout shelters. The wafer with an estimated shelf life of 5 years or longer is made from whole grain that has been parboiled, dried, puffed, crumbled, and made into a wafer of average cookie size.

Boy Scout Nature Muse

By Te Pettit

Ted S. Pettit.

ANYONE driving past the National Headquarters of the Boy Scouts of America in North Brunswick, N. J., on a sunny Sunday should be advised that the cars jamming the parking lot belong to visitors who have come to see the newly opened Outdoor Nature-Conservation Museum and the nearby Johnston Historical Scouting Museum.

After more than 4 years of planning and construction the outdoor demonstration areas are now open to the public. Cub packs, Boy Scout troops, Girl Scout units, family groups, and other conservation-minded visitors come in droves each weekend to study the more than 100 exhibits, displays, and on-the-ground demonstrations that depict Nature in action and what good conservation means.

The Outdoor Nature-Conservation Museum is designed to accomplish two purposes: One is to interpret the ecology of more or less typical wet, eastern hardwood forest in terms that anyone can understand. The other is to create an awareness of the importance of all natural resources, both to people as individuals and to the welfare of our country and our standard of living in a democracy. There are several hoped-for goals. It is hoped that the visitors will see that each phase of the world of Nature—geology, climate, soil, water, plants, wild animals, and man—is interesting and important in itself, but that, at the same time, all are closely interrelated.

To accomplish these purposes, the 60-acre area has been divided into two sections. Visitors first walk around a half mile gravel trail through typical eastern hardwoods. There are signs that identify the major plants that grow there naturally. These signs also point up the place of each plant in the total. Other signs point out such things as evidences of past land use and geological, physiological, and climatic features, and their influence on the forest. Still other trailside signs point to animal dens, nests or burrows, and other evidence of the existing wild animal populations.

Along this trail, too, are six clearings, each containing a number of panel displays, many in three dimension, and other kinds of exhibits—all designed to explain simply and clearly the dynamics of Nature and their interrelationships. Thus, the geology area explains such features as the origin of the earth, how rocks are formed, and the geologic history of New Jersey. Most displays are natural rock and mineral samples.

In the same way, the weather-climate area explains weather and climate and their relation to the world of Nature and man's activities on earth. Some of these displays are changed so that hurri-

SCS display tells how Mother Nature makes soil.

Note:—The author is director of conservation of Boy Scouts of America, New Brunswick, N.J.

Outdoor Conservation Classroom

By T. Pettit

canes, thunderstorms, blizzards, or droughts are explained in their appropriate seasons.

The soil area covers such subjects as man's dependence on soil, soil properties and charactertistics, how soil is formed, the soils of New Jersey, and different soil formations from four parts of the United States. Among the water exhibits installed to date are a large panel on the hydrologic cycle, a well to show what "water table" means, and working models showing evaporation, transpiration, infiltration, and runoff. The plant and animal areas are similar in approach.

The purpose of all of these demonstrations is to point up Nature in action—the basic ecology of the area. The use by man of these resources is the subject of the second section of this 60-acre plot.

Thus in a conservation demonstration area covering some 10 acres, several examples of good land use have been established. There is a ⅓-acre farm pond, stocked with bass and bluegills. In the fall and spring, wild mallards, black ducks, geese, and other waterfowl use it daily. A pair of mallards nested there in 1961. Nearby large aquaria provide a closeup view of fishes of the State, turtles, frogs, and other aquatic life.

Also near the pond are three wildlife food plots, and a number of brush-piles that provide food and cover for rabbits, quail, pheasants, and songbirds. Multiflora hedge rows, wildlife food and cover shrubs, a model 1-acre pine plantation, and a grassed waterway have been planted.

Along the sides of a ¼-acre man-made slope, are runoff plots to show the beneficial effects of contour planting, crop strips, and sod cover, as compared with up-and-downhill cultivation with no soil protection. A catch basin at the bottom provides a dramatic comparison of runoff and soil loss under various practices. At the exit of the conservation area is a watershed model which explains not only a watershed as a unit for conservation planning, but also various other good land-use practices that cannot yet be demonstrated on the museum grounds.

Along the trail and around the conservation area are other features of interest to the visitors, including bird houses and feeders. In time, concrete casts of animal tracks—from dinosaur to man, but all native to New Jersey—will serve as trail markers to guide the visitor on his 2-hour tour to see for himself how Nature works and what good conservation means.

The technical or financial contributions of various local and national and State agencies and private interests have made the Outdoor Nature-Conservation Museum possible. They include, for example, the Freehold Soil Conservation District; the Soil Conservation Service, Rutgers University, the New Jersey Department of Conservation; industry and interested individuals; the Forest Service, the Weather Bureau, the Bureau of Land Management, the Geological Survey, the Fish and Wildlife Service, the Sport Fishing Institute, and a large farm equipment manufacturer.

Situated as it is, within an hour and a half drive of a population exceeding 11 million, this project has a tremendous potential as a means of educating large numbers of metropolitan and suburban residents in some of the basics of conservation and natural history.

Conservation Director Pettit and Scouts study farm pond at BSA national headquarters.

Milwaukee Schools Go All Out For Conservation Teaching

By Marvin Schweers

A COMPLETE revamping of the course of study in the Milwaukee public schools to include everything from A(ir) to Z(oos) as they relate to conservation has taken place during the past decade. As a result, every school day 106,000 Milwaukee school children from kindergarten through high school are now exposed to some phase of conservation education.

Largely responsible for this changeover to give greater emphasis to conservation is Roy S. Swenson, supervisor of conservation, science, and outdoor education.

"One of the great social and economic challenges of our day," Swenson will tell you, "is to awaken the public to the need for more intelligent use of our resources to serve an expanding population. This is especially significant in Milwaukee and the lakeshore area, where three-fifths of Wisconsin's people live."

Although plans had been developing over the past decade, integrated instruction in science and conservation has been a fact in the Milwaukee public school course of study only since 1959. The program to focus more attention on conservation, Swenson explains, is built on a six-point base: (1) Research, to find out what the need is and how best to meet it; (2) classroom instruction in the several fields of conservation subject matter and at appropriate grade levels; (3) supplements to classroom instruction through outdoor experiences and television; (4) pre-service and in-service teacher training; (5) public relations, to keep teachers, students, parents, officials, and the community informed on the need and methods of meeting it; and (6) the materials of instruction or classroom equipment.

Roy S. Swenson with a conservation education resource unit.

Subject-matter emphasis at specific levels through the elementary grades and high school avoids both duplication and omission. In the Milwaukee system, students have what Swenson calls "exploratory experience" in all units of science from kindergarten through the 12th grade. For example, one area of major emphasis is the earth. In the kindergarten and first 3 primary grades, pupils study soil, rocks, weather, and air; in the 4th grade, rocks and minerals; in the 6th grade, air; in the 7th grade, weather; in the 8th grade, water and soil; in the 9th grade, rocks and minerals, air, water, and weather; in the 10th grade, biology; in the 11th grade, chemistry; and in the 12th grade, physics.

Each of the 140 public schools in Milwaukee has new equipment that could make the science teacher

A typical Wisconsin conservation dairy farm.

Note:—The author is State conservationist, Soil Conservation Service, Madison, Wis.

of a few years ago green with envy —television and other visual aids, portable science demonstration desks, binoculars, planetaria, microprojectors, and microscopes, among others.

"The upsurge in interest in conservation is tremendous," Swenson finds. "Young people are reacting very favorably to the inclusion of more conservation in their course of study."

Citing a University of Illinois study showing that 8 out of 10 children in elementary grades listed science as their No. 1 school interest, he emphasizes that "we're trying to capitalize on and satisfy that interest," and points out that "many of the science units at the elementary level are the natural sciences and relate directly to conservation."

Under Swenson's guidance, the Milwaukee school system has helped in the development of an abandoned farm in Kettle Moraine State Park, near Palmyra, for use as an outdoor classroom. Wisconsin's geology and its relation to conservation and multiple land use are emphasized on trips to the farm. Obtained by the Milwaukee Board of School Directors in 1947, this 50-acre Milton C. Potter School Forest, which Swenson supervises, also serves as an outdoor laboratory for conservation education and nature study. Thirty-five acres include one of the few remaining stands of virgin timber in Milwaukee's metropolitan area. Swenson is directing a long-range reforestation program on the other 15 acres, formerly used for farming.

Each year, more than 5,000 elementary and secondary school pupils study Nature and learn about the importance of conservation of natural resources through organized field trips to the forest.

"Emphasis in teaching conservation must create an awareness for the need of an action program," Swenson says of conservation education. "Understanding the need for harmony between man and nature develops an attitude. Attitude in turn develops into a way of life—the goal of good conservation education. Educators share the responsibility to bring about this needed philosophy."

Conservation Teaching Geared To Everyday Community Life

By Arthur W. Emerson

TEACHING conservation in the high school of Canyon City and John Day is geared to actual life in this eastern Oregon community which is surrounded by farms and ranches and shadowed by towering mountains with their forests and wild game.

And that is the way it has been since L. J. "Pete" Baucum started conducting one ½ hour conservation class a week as an extra-curricular activity a decade ago. He visualized his students studying conservation as they lived their everyday lives, so that, as each topic of natural resource conservation came up in the classroom, it would fit into the daily doings of the community.

Pupils and other teachers immediately showed so much interest, back there in the early 1950's, that

Instructor Baucum and conservation class members study land leveling and pasture improvement on his farm.

Note:—The author is field information specialist, Soil Conservation Service, Berkeley, Calif.

In the classroom, he explains use of grasses for improved pastures.

the principal agreed to a 1-hour daily course, called "Soil and Water Conservation," for Baucum to teach. The class is made up of junior and senior high school students, and 1-hour credit is granted for the course.

"It is desired to provide in our curriculum a course of study which will give to our students a greater knowledge of nature and the natural resources of Grant County and Oregon," Baucum says of the conservation course with seven units as its guide.

It is designed to develop an understanding of what Grant County's and Oregon's natural resources are; how they affect the economics of the area; good conservation practices in protecting these resources and making better use of them; how best to enjoy the natural resources; and how to assist agencies in the State in carrying out good conservation practices.

Soon after school opens in the fall, the hunting season is in full swing; so the "natural way to teach" understandably begins with Unit 1 on "Wildlife Conservation and Management."

Right here the pupils also start studying land use and management, in its original environment, integrated with a safety program, and how it all fits into their everyday living—good game management; good land cover; clean, clear, even-flowing water for home, farms, and livestock. Similarly in Unit II on "Conservation of Game Birds," they learn how good land use and soil and water conservation practices improve game birds' environment.

Unit III on "Forests and Their Management" follows logically into the wintertime lumbering season. This unit includes the teaching of forest, soil, and water management, in addition to how to fight forest fires, tree identification and scaling, and forest insect damage and control.

The objective of Unit IV—"Conservation of Our Soil and Water"—is to point out to the pupils the importance of both water and soil to everyday needs. They study soil maps obtained from the Soil Conservation Service, and farm and ranch conservation practices, power dams and their importance, irrigation water, and high mountain watersheds that supply water to cities and rural areas. The importance of conserving soil and water by the use of various erosion control and other conservation methods is emphasized. Baucum has a conservation program on his own farm.

In Unit V on "Grass and Weeds: Identification and Their Values," the students learn 80 different weeds and grasses common to the area, and learn the best grasses for holding soil and water, while getting a better concept of the forage big game and domestic animals use.

Unit VI—"Fish Management" likewise is comprehensive.

In the final Unit VII—"Conservation of Our Natural Beauty"—the class pays special attention to scenic and recreational resources and values.

Throughout the school year of classroom and field studies, all available teaching aids are used. Rural Life Sunday and Soil Stewardship Week are observed. Soil conservation district supervisors and Soil Conservation Service, Forest Service, and other agency representatives all give a helping hand to Conservation Teacher Baucum, who also devotes personal time helping in the countywide teacher conservation workshops. Both elementary and high school students get a look at soil and water conservation through their regular classes.

The Grant Soil Conservation District sponsors an annual conservation speech contest. Trees have been planted on the school grounds, and a woodland thinning and tree planting demonstration area is operated with the county interagency committee.

F. P. Doyle, the present Canyon City-John Day High School principal, has much to back up his belief that this course in soil and water conservation is unique and one of the best in Oregon.

Class gets instruction in tree planting and care.

Kids' Cartoons

Liven Conservation Interest

By James L. Woodard and Louis J. Dondero

The first-place cartoon.

THE thrill of competition and the fun of drawing pictures are stimulating lively interest in conservation education in some Vermont schools.

Attention to soil and water conservation and resource use is not new to Vermont educators. "Conservation Adventures with Dick and Debbie," a picture book sponsored by the Vermont Association of Soil Conservation District Supervisors and business firms in cooperation with the Commissioner of Education, has been used widely by Vermont school teachers and children. In addition, the State Department of Education has provided teachers since 1957 with "Conserving Natural Resources in Vermont," a curriculum bulletin on conservation education for grades 1 to 12.

The new conservation cartoon project, launched under Bennington County Soil Conservation District sponsorship, resulted from growing interest in making better use of conservation picture booklets published by the Soil Conservation Society of America. Soil Conservation Service technicians working with the district suggested the 1962 conservation cartoon contest as a new twist in stimulating both student and community interest in the subject of soil and water conservation so important to all.

The idea caught on fast. Every local merchant who was asked to contribute did so with real interest. Some indicated they would like to make it an annual affair; and one heavy equipment company breathed real life into the idea with a donation of $100 to buy 2,000 copies of the Society's booklets.

Legwork for the contest was handled by a four-man committee made up of Albert Horst, Bennington County district supervisor, Banker George Jepson, and the authors.

More than 900 7th and 8th grade pupils in the 4 Bennington County school districts were given copies of 2 of the Society's booklets, "The Story of Land, Its Use and Misuse" and "The Wonder of Water." Mimeographed instructions and a set of simple rules were passed out to all teachers and students, and each classroom was provided with a poster showing 6 sample conservation cartoons by Felix Summers of SCS.

The contest ran for a month so teachers could fit the conservation theme into their other classroom activities. It ended on March 15. The award for each of the four district winners was a pen set on a marble base; and for the top county winner, a $25 U. S. Savings Bond in addition to the pen set. The three judges included Don Trachte of "Henry" comic strip fame.

One hundred and twenty-five cartoons were submitted from 9 7th and 8th grade classes in the county—considered by the contest committee as a good start for the first year. Irene Lalonde, a 7th grade student at the Sacred Heart School, Bennington, won first prize. The other three winners were

Note:—The authors are, respectively, conservation aid and soil scientist, Soil Conservation Service, Bennington, Vt.

Cartoon contest winners with SCD Supervisor Albert Horst, l. to r.: Nancy Lawson, Susan Pratt, Irene Lalonde, and Lisa Dillmann.

Nancy Lawson, Bennington High School 8th grader; Lisa Dillmann, Manchester Elementary School 8th grader; and Susan Pratt, 8th grader from the Pownal Elementary School in the Bennington Southwest District.

The best of the cartoons are being displayed throughout the county. Newspapers have printed stories about the contest, giving the winners special recognition for their work, as well as due credit to all the pupils who took part in the conservation competition.

Conservation contests are not an educational end in themselves; but they have demonstrated that they can serve a definite function in the school program—as a teaching aid, as a roundup activity following the year-long study of conservation, or as an integrated part of a conservation teaching unit. Beneficial side effects have included stimulation on the part of parents and others in the community.

Sister Ellen Therese, principal of St. Francis de Sales Academy, distributes cartoon contest material.

"We think the conservation cartoon contest has already done a great deal for conservation education in Bennington County," the committee reported. "As the idea grows in years to come, it should make quite an imprint on conservation in Bennington County."

The committee already is planning ways to increase particiapation next year. Advance letters to principals and standard sizes for the cartoon are among the new ideas.

A WOMAN'S WAY

In Conservation Education

By Milton E. Bliss

Margaret Black (right) explains glacial origins of Iowa soils to Drake University students, l. to r.: Karen Sachse, Marilyn Polich, and Sam Pugh.

ASSISTANT Professor of Science Education Margaret Black of Drake University explains the continuing popularity of her classes in conservation education as "the yeast in teaching conservation is a well planned field trip."

Over the past 22 years at Drake in Des Moines, Iowa, Miss Black has seen more than 2,000 of her students become interpreters of the outdoors to their pupils, families, and friends. Practicing what she preaches, Miss Black sees to it that her students get a good share of their training through field trips, Nature study groups, hiking clubs, conservation camps, and a Children's Forest.

She defines conservation as the "science of the outdoors, an approach to outdoor living, an appreciation of things in their natural environment, including the

Note:—The author is field information specialist, Soil Conservation Service, Milwaukee, Wis.

relationship of people to the world they live in." Probably one reason why Miss Black's classes in conservation are so popular is that they help would-be teachers overcome their fear of the world about them.

"Too many teachers are afraid of the outdoors," she points out. "My job is to help them understand it better so they, in turn, can explain it to their students."

Former students and other teachers from New York to Hawaii and the Philippines are using her methods and expounding her philosophy.

As a teacher at Callanan Junior High School in Des Moines during the 1930's, Miss Black often took her students outdoors after school hours and on Saturdays to explore the world of Nature about them. The Saturday trips, largely with Girl Scout troops, were giving the girls the edge in classwork.

"As a result," she recalls, "the boys began to complain that the girls were getting too much extra attention."

The outcome of this little jealousy was a request from school officials to review and revitalize the whole science education program in the Des Moines public school system. Miss Black was so successful in this undertaking that she was invited to become a member of the Drake faculty, where she has been since 1940.

"Anyone who works in conservation education must see the total conservation picture," is Miss Black's view. "True conservation education aims to develop an appreciation of all resources—soil, water, minerals, people, parks, wildlife, wilderness, even space itself. Its main task is to enlarge the students' vision so they see the broad picture. Good conservation education exposes them to the geologic past, develops an appreciation of the resources that sustain us, and an understanding of the interdependence of people and their environment."

Miss Black says she constantly has to correct the notion among teachers that "conservation is the farmer's job," but she points out with satisfaction that "teachers are better informed on conservation than administrators are."

"Good conservation teachers feel the need to spend more time with their students out of doors," she says. "This feeling is growing to the point where school administrators will have to find an answer to the problems now posed by mass bus transportation, safety precautions, and conflicting or overlapping class schedules, because anything that so enriches the lives of young people ought not to be denied them."

"I try to awaken them to an awareness of their involvement in decisions that relate to local conservation problems," she explains. "Questions are the key, but I include, also, such things as a roll call with conservation news items and the making of books of clippings concerning current information about conservation as published in newspapers and magazines."

But she says the crowning event in her career is the success she has had in developing the Children's Forest at Ewing Park, a 33-acre tract 8 miles southeast of Des Moines. Each year on the weekend closest to April 22, birthday of J. Sterling Morton, father of Arbor Day, groups of children from the Des Moines area plant trees of their own selection in the park. Anyone may participate, but children, especially, are encouraged to plant.

The project is an outgrowth of Miss Black's early teaching experience with Scout members, hiking clubs, and other youth groups interested in learning more about the outdoors. The members of the women's chapter of the Izaak Walton League of America are making further development of the forest their major project. A member of the women's chapter of the League, Miss Black is chairman and director of planting for the Children's Forest, among the numerous active and honorary memberships she holds in conservation and other organizations.

Fifth-graders of North Polk Community School, Elkhart, Iowa, admiring redbud tree they had just planted in Children's Forest.

◆

Total average water supply in the United States is about 4,300 billion gallons a day; but about three-fourths of this supply is used by vegetation or is evaporated from the land.

From Backyard Garden To Conservation Truck Farm

By Marvin F. Bureau

AN Ohio high school science teacher and his bank-teller son capitalized on the son's vocational agriculture training and soil conservation technical help to parlay their backyard garden into one of the larger truck farms in Wayne County. They are Floyd and David Maurer, whose 44-acre strawberry and sweet corn farm had its beginings a dozen years ago in Wooster.

Their interest in truck farming dates back to 1949, when David became a vo-ag student at Wooster High School. Their first venture, with 500 strawberry plants in their own backyard, was so successful that they added sweet corn and expanded to several neighboring backyards.

As a senior, in 1952, David received the State Farmer Award, a rare accomplishment for a nonfarm boy. After graduating from Ohio State University in 1956, with a major in vegetable crops, he returned home to a job as teller and farm representative for a bank.

The Maurers then set out to buy suitable land to expand their part-time farming operation. Previous experience and David's college training made them keenly aware of the importance of selecting the right soil type and topography. A deep soil would be necessary. It should have good year-round internal drainage, yet not be too droughty. It should be at a high elevation on an east-facing slope for the least danger from frost.

Aware of their need for technical help, the Maurers turned to the Wayne County Soil and Water Conservation District. Soil survey maps at the Soil Conservation Service office helped them make a much faster and wiser decision in selecting the land they finally bought.

With SCS help available through the district, they developed an unique soil and water conservation plan for their acreage of choice Wooster silt loam soil. Their land has a gentle, but quite long slope; and erosion was a hazard. This danger was overcome by laying out 80-foot-wide contour strips for a 6-year rotation—2 years of strawberries and 1 year each of sweet corn with a ryegrass cover crop, sweet corn alone, wheat, and alfalfa-timothy meadow.

Father Floyd spraying strawberry plants.

David Maurer makes sprinkler irrigation set in strawberries.

The Maurers have found this cropping plan profitable and effective in controlling soil and water losses. They use all the wheat straw as a mulch for their strawberries, then plow it under. They leave a turnland that divides the contour strips evenly. This arrangement gives them the same annual crop acreage.

The Maurers drilled a well and put in a sprinkler irrigation system. This system serves not only to supply moisture at critical periods, but also protects the straw-

Note:—The author is soil scientist, Soil Conservation Service, Wooster, Ohio.

berries from frost when the plants are in the sensitive stage of flowering.

"In May 1961," David recalls, "we were especially thankful to have selected the right soil type for our operation. Several frost scares occurred when the berries were in full bloom, and it was necessary to turn the sprinklers on overnight. Rainfall had been heavy and the additional water could have caused waterlogging and serious damage to the berries if our soil hadn't had good internal drainage."

The real proof of their "shortcake," is the Maurers' production records. Strawberry yields have averaged a respectable 6,000 quarts an acre, with one patch producing 7,000 quarts an acre. Sweet corn yields recently topped 1,200 dozen ears to the acre, and have averaged 800 to 900. Their wheat has averaged 35 bushels an acre.

Strawberry plant sales also have become a big item with the Maurers since 1958, when they were registered to sell virus-free plants, which are considered by some horticulturalists to be among the best obtainable.

Thus conservation education is continuing to pay off for young David Maurer—and his Dad!

Conservation Increased Through Classroom Teaching

By Gene F. Bohnenblust and Daniel E. Holmes

LEARNING about the great out-of-doors in the classroom is bringing practical conservation results in Kansas public schools.

At McPherson, for example, a course in conservation and natural science is offered to the 12- to 15-year age group in the city schools. And in Harper County, as another example, the teaching of conservation in the schools has been reflected in increased soil and water conservation activities by the children's parents and neighbors.

This is a new field of education in the McPherson schools for the eighth grade pupils, whose attention is focused upon the natural environment of plants and animals around them—the role of fertile soils, clean water, plants, animals, and food in Nature's life cycle.

Farm-reared, locally knowledgeable John Colyn teaches the class, in addition to teaching a full schedule and general science classes. A graduate of McPherson College, he also has a Master's degree in biology from Kansas State Teachers College at Emporia, one of the State's leading institutions in teacher conservation training. His conservation class, the first such accredited class in Kansas schools, receives attention far beyond that of the usual class.

"We think our class is unique and definitely has a place in education today as we observe people being farther removed from Nature," Colyn said. "We seem to be heading toward the belief that blue prints and plans and numbers are the most important things in this

Instructor John Colyn (right) with the McPherson Intermediate School's conservation and natural science class.

Note:—The authors are work unit conservationists, McPherson and Anthony, Kans., both of the Soil Conservation Service.

A Saturday class project—cleaning land around a farm pond and planting multiflora rose on area for outdoor conservation laboratory.

world. We are forgetting that everything we have or ever will have comes from Nature."

The class had its beginning after the McPherson County Fish and Game Association launched a program aimed at improving and conserving wildlife resources. Colyn, former junior high school teacher, uses a three-phased approach. This includes a study of wildlife—birds, mammals, reptiles, fish, and other organisms; a study of wildlife environment, such as soil, water, food, and cover; and a study of the human factor in conservation. There was no textbook, so Colyn developed his own objectives, and planned classroom activities, field trips, and film lists.

Conservation specialists and others who have led classroom discussions and field trips have included everybody from a local nurseryman and former Forest Service official to the Soil Conservation Service work unit conservationist, and from the superintendent of the McPherson Public Utilities to a McPherson College biology professor. Films from the SCS, the Audubon Society, Forest Service, and others are shown.

Class members take many field trips to learn about conservation first hand. They have visited a fish hatchery, quail farm, a bird banding station, a wildlife refuge, and have studied soil and water conservation projects. Before a student can pass the conservation and natural science course, he must complete at least one project during the year. This may be building a bird house or some other activity for improving wildlife habitat.

Colyn encourages his students to bring animals to school. Along with many mounted birds and trophies in the classroom are a live one-winged great horned owl and a one-legged marsh hawk.

The pupils have returned their new conservation knowledge to the community. As one class project, for example, they have been converting a pond and small tract of land owned by McPherson College into a wildlife refuge. The pond, a favorite haunt for waterfowl and other game birds and wildlife, should be ready for fishing next season.

"Everyone's behind the class," is the way one mother summed up its success, "and there are no disciplining problems. This class toughens up adolescent girls who scream at the sight of snakes and worms. They learn that the world needs kindness rather than shallow showoffs."

The Harper County conservation teaching grew out of 4 years of drought, and the suggestion by a Harper County Soil Conservation District supervisor in 1956 that, somehow, farmers and city dwellers alike must be made to realize what erosion was doing to their farmlands and to their community. Another suggested that, in order to reach parents with the story, it would be necessary to interest their children first.

The history of conservation is taught as a unit of Kansas history, and pupils study conservation in their science classes throughout the year; but something more was needed to spark further interest in conservation for the children. The result was the start of a contest, which that fall produced 97 posters and 37 essays, from about 30 percent of the county's eligible children. Winners were announced at the district's annual meeting, for which students, parents, and teachers turned out.

Next, a half-day was set aside at the annual fall County Teacher Institute for the district supervisors to present a program on soil and water conservation. An annual "Soil and Water Conservation Week," proclaimed by the county superintendent of schools, followed, during which classes in all the schools see conservation movies, go on conservation tours, and watch demonstrations on conservation work.

The interest in the classroom is credited by the supervisors with a good measure of the increased conservation work now found on the land in Harper County. Applications for conservation farm planning help jumped from an average of 55 for the 3 years before 1956 to 125 in 1961.

Soil and water conservation kept pace. Terracing, grassed waterways, and erosion control dams doubled; and seeding of native pastures multiplied five times.

TV Brings Conservation Into Tennessee Classrooms

By Grace Batson

A FAINT click, a low hum, and several thousand boys and girls, seated at their classroom desks, visited areas with deep gullies and eroded canyons. They saw the dust bowl and the effects of rainfall on protected and unprotected farmland.

Charts, diagrams, and experiments helped the children understand just how soil and water conservation, or the lack of it, affects them right now. They were urged to check their schoolyards, homes, and playgrounds for erosion, and to try corrective measures where needed.

Again a faint click, the picture fades from a large TV screen, and the science lesson, featuring conservation, is over for the day. The TV lessons themselves, however, are just the beginning. The children are learning in a way that goes far beyond memorizing facts. They are learning how to use what they are learning.

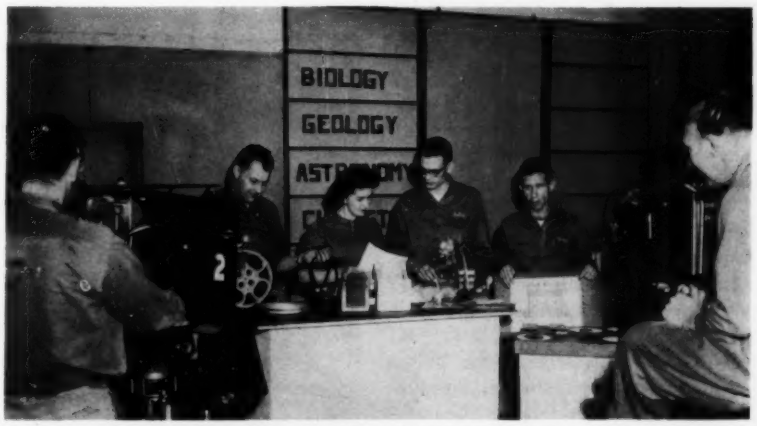
This and other typical lessons on conservation are a part of the experimental program of science teaching by TV that was started in 1960 by the Davidson County, Tenn., Board of Education, at the suggestion of County School Superintendent J. E. Moss.

Station WSM-TV agreed to give two 30-minute periods a week as a public service, and to tape the programs so the lessons might be rerun later. The sixth grade science series, "Adventures in Science," was on its way! The two other local television stations, WSIX-TV and WLAC-TV, since have given equal science and other educational telecast time. A committee of teachers revised and broadened the science curriculum for all grade levels.

Helpful materials for the telecasts and classroom use are obtained from county, State, and Federal agencies. For example, the Soil Conservation Service has furnished film clips, colored slides, and photographs for telecasts, as well as bulletins for classroom use.

The advantages of teaching by TV are tremendous.

Nature study involves a lot of looking, often at very small objects. The TV lens can magnify many objects too small to be shown effectively in the classroom, such as a seed. Television can take all the children in a classroom to visit a



Cameras ready to roll as Director Dallas Thomas (2d from right) checks with TV Teacher Grace Batson.

This and other Tennessee conservation farming scenes have been brought into classrooms by TV.

Note:—The author is television teacher, Davidson County Board of Education, Nashville, Tenn.

GOVERNMENT PRINTING OFFICE
DIVISION OF PUBLIC DOCUMENTS
WASHINGTON 25, D. C.

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, $300
(GPO)

PUBLIC LIBRARY
JUL. 13 1962
DETROIT

If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

conservation farm, can let them take a walk in the woods and see a squirrel looking for food in its natural habitat, can show them a poisonous snake without danger. The magic screen can look into places that might not be open for class visits, because of distance, safety regulations, or expense.

At the beginning of the project, only Davidson County schools were intended to participate; but other school systems soon were writing or calling for permission to use the programs. Two years later, 33 other school systems, with about 25,000 viewing students, in surrounding counties used the programs and accompanying guides, plus adult and preschool viewers.

Television as an aid to conservation and other teaching in Tennessee will be extended still further this year. The Davidson County school system and the Nashville city school system have become joint owners of a new educational station; and in September WDCN-TV will go on the air with a schedule of programs for primary grades through high school.

A testing program carried on all year at the end of the first year showed that children with classroom teaching supplemented by television teaching were able to progress substantially further and faster than those with classroom teaching alone.

Our Job and Yours

Dr. George A. Selke.

"Nonfarm people must understand their own stake in conservation. They must realize that the preservation and conservation of any individual farmer's land is in reality conserving the Nation's basic capacity for agricultural production in the future. Hence an important objective of conservation education, as stated by the Federal Extension Service, is to 'encourage all people to accept, as citizens, a feeling of responsibility and concern for resource conservation to the extent that they contribute individual effort toward its accomplishment' . . . .

"Since its inception, SCS has responded to the needs of school people for information dealing with use and conservation of land resources. The importance of this work, similar to that of the Forest Service, is emphasized by the fact that today about 26 percent (or nearly 48 million) of our total population is in the classroom as students, teachers, administrators, or in other positions associated with the professional education field. Of this number, more than 15 million are school-age boys and girls who take part in the conservation activities of 4-H Clubs, Future Farmers of America, Boy Scouts, Camp Fire Girls, Girl Scouts, and Junior Audubon Clubs. . . .

"The Secretary of Agriculture is cognizant of the problems affecting land, water, forests, grasslands, and wildlife, and has a deep personal interest in conservation. We pledge our cooperation in the total conservation education job to be done, and we invite your cooperation. Conservation education is a job for all of us, working together."

—From an address by Dr. George A. Selke, Assistant to the Secretary of Agriculture.

S. 8 3585

SOIL CONSERVATION

Index

VOLUME XXVII

August 1961 to July 1962

UNITED STATES DEPARTMENT OF AGRICULTURE

Issued February 1963

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. - Price 10 cents

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL CONSERVATION—INDEX TO VOLUME XXVII

AUGUST 1961 TO JULY 1962

ABBOTT, JAMES D.: Early GPCP Brings Many Benefits — Page 78–79
Ackerman, Ralph, uses cover crops (Mich.) — 30
ACP Aims at Conservation Needs Target: Carl Larson — 228–229
ADAMS, HENRY R.: Review of Megalopolis the Urbanized Northeastern Seaboard of the United States — 168
After a Century New Generation Takes Over. Robert F. Tegner — 246–247
Agriculture, Commissioner of, report for 1862 — 251
Alabama—
river basin development speeded by Needs Inventory — 239
shifts in land use — 245
ALVERSON, KENT: Project Solves Water Problems for Illinois City and Farmers — 130–131
American Wildlife and Plants, a Guide to Wildlife Habits. Review by Lawrence V. Compton — 192
Anderson, Richard, increased production on his range — 76
ANDREWS, ARLAND W.: A Fish Story—Plus — 191
ARCHER, HARRY W.: Machinery Dealer Finds SCD Brings More Business—Better Community Life — 118–119
ARCHER, SELLERS G.—
Conservation Needs Figures Welcomed in Carolinas — 232–233
Georgians Meet a Rurban Problem Head On — 154–155
Youth Conservation Is Watershed By-Product — 65
Arizona—
fuller use of irrigation water — 34
Plant Materials Center furnished sprigs — 203
soil and water conservation go hand in hand — 5
White Tanks project pays individual and community dividends — 126
Arkansas—
Six-Mile Creek watershed also used for recreation — 180
profitable minnow business — 8
River Multiple-purpose Project (Ark. and Okla.), progress in 1961 — 163
technicians assemble data on soil — 233
Watershed Project Boosts Economy. Hollis Williams — 135–137
ARS— Page
authorized to expand watershed research program — 237
study shows flood and sediment reduction saved money (Ark.) — 136
works with stripcropping (Va.) — 59
ASCS—
cost-sharing aid—
conservation measures (W.Va.) — 141
furnished West Ditch Irrigation Co. under pooling agreement — 18
gave substantial help (Nebr.) — 142
gives all citizens best information (Va.) — 153
half orchard cost (Wash.) — 71
helped finance erosion-control dams (Colo.) — 86
helps get poor cropland into grass (Tex.) — 88
in constructing reservoir — 16
in Great Plains — 75
in Sutter County, Calif — 47
interests farmer in Xmas trees — 102
participated in by district cooperators — 230
provides irrigation (Mont.) — 92
represents only part of program — 245
stable and profitable soil and water conservation (S. Dak.) — 7
purchased South Carolina Needs Inventory — 233
soil conservation districts — 109
source for Conservation Needs Inventory — 222

BAGLEY, WALTER T.: Chemicals vs. the Hoe in Windbreak Plantations — 46
Bailey, Homer, ranch good example of pasture management (Mont.) — 259
BAKER, JOHN A.: RAD—a New Tool for Rural Community Improvement — 132–134
BARRE, R. C.: Octogenarian "Village Blacksmith" Forges Conservation Link — 254–255
BATES, RAY W.: Coastal Bermudagrass Proves Self in West — 203
BATSON, GRACE: TV Brings Conservation into Classrooms — 287–288
Baucum, L. J., started weekly conservation class — 279
Bayou Bartholomew (Ark., and La.), progress in 1961 — 163
BEARD, J. E.: Virginia's Fairfax County Outstanding in Urban Action — 152–154
BEARD, JOHN C.: "We Pledge Ourselves" — 275
Beauchamp, Judge Tom L., planned brush clearing and pasture improvement — 93

BRANBAUGH, P. H.: Young Campers Learn About Outdoor Conservation ... Page 174–175
BEDELL, GLENN: Michigan Counties Use Soil Surveys to Measure Needs ... 235–236
Beery, Roy, interested in Xmas tree farming ... 102
BELL, RALPH N.: Fishing Tourists Need Bait N. Mex. "Fish Farmer" Obliges ... 185
Benjamin, Walter, solves stone problem (Vt.) ... 139
BENNETT, DAVID A.: Old Farm Stays Proudly on in Megalopolis' Path ... 262–263
Bennett, H. H—
established project to control erosion (Tex.) ... 253
posed beside marker of site of first watershed project in the U.S. ... 264
wrote about poor soil and water resource management ... 258
Bennett, J. Frank, range output more than doubled (Tex.) ... 88
BERNARD, JOHN: 30,000 People Helped Measure Nation's Conservation Job Ahead ... 220–221
BERNATH, GLEN E.: Minimum Tillage Licks "Goose-Drowners" ... 43–44
Bevan, Art, concrete-ditch lining cuts water delivery time (Nev.) ... 68
Big "C" Stands for Connally—Cattle—and Coastal Bermudagrass. Harold V. Stephans and Fritz Graeber ... 129–130
BINGHAM, LEROY M.: Land Leveling "Down East" in Maine ... 52–53
BISHOP, RALPH E.: Desert Spring Development—Indian Ponies to Dozers ... 55
Black, Margaret, helps teachers understand outdoors (Iowa) ... 283
BLAKELY, B. D.—
Review of Chemical and Natural Control of Pests ... 72
Review of Soil Conditions and Plant Growth ... 48
Soil Management Principles for Conservation of Cropland. Picture story ... 36–37
BLICKENSDERFER, C. B.—
Better Plants and Pastures for Florida's "Flatwoods." With Harry J. Haynsworth ... 204–205
Grass Rotations Boon To Florida Vegetable Business ... 158
BLISS, MILTON E.: A Woman's Way in Conservation Education ... 282–283
Blodgett, Howard, led irrigation water around with shovel (Mont.) ... 92
Blunt, Floyd, replaced fencing of Johnson Creek area (Wyo.) ... 186
BOHART, CHARLES V.: 8,000 Acres in Woody Plantings for Nebraska Wildlife ... 214–215
BOHNENBLUST, GENE F.: Conservation Increased Through Classroom Teaching. With Daniel E. Holmes ... 285–286
Bonsall, Joe, farm example of changing land use ... 177
Bookhout, Lynn, goes entirely into grass (N.Y.) ... 101
Book Reviews. *See* Reviews
BORNSTEIN, JOSEPH: Only a Stone's Throw To Rural Area Improvement ... 139
BOWEN, LEE: District profile. G. W. and Dolores Montgomery of Missouri ... 144
Boy Scout Nature Museum Outdoor Conservation Classroom. Ted S. Pettit ... Page 276–277
Breashear, Cecil, successfully started seed production (Tex.) ... 208
Breckheimer, Cliff, 1961 wheat yields increased (N. Dak.) ... 76
BREHM, C. D.: South Dakota Earth Moved in Year Would Build 30-Mile Dam ... 64–65
Briar, A. J., pastures improve through conservation ... 77
Bridge saved by teamwork (Okla.) ... 128
Broadview Farming Co. uses water until it wears out ... 11
BROBERG, DONAVON E.: Tame Pasture Works for Father-Son Team. With Gene L. Williams ... 87
BROHARD, ENCIL: Strip-Mine Land Can Be Salvaged ... 66–67
BROWER, FRANK R.: Conservation Needs Information Speeds River Basin Planning ... 239
BROWER, ROYCE B.: District Programs Work for the Farmer ... 100–101
BROWN, CARL B.: Watershed Lakes and Farm Ponds Boon to Recreation and Wildlife ... 180–182
Brown, Edmund G., refuses to preside over liquidation of agricultural land (Calif.) ... 150
BROWN, RAYMOND S.: Teaching Teachers To Teach Resource Conservation ... 268–269
BUIE, T. S.: Conservation Farming Overcomes Southeast's Centuries-Old Problems ... 244–245
BUREAU, MARVIN F.: From Backyard Garden To Conservation Truck Farm ... 284–285
Bureau of Census estimates population at 420 million by 2000 ... 109
Bureau of Land Management—
aids soil conservation districts ... 109
permits part of ranch operation ... 104
Bureau of Reclamation helps with training center (N. Dak.) ... 271

California—
Department of Fish and Game checked wildlife, food, and cover planting ... 114
desert springs source of water ... 55
Farmers Have System for Meeting Conservation Needs. Austin D. Warnken ... 230
Mohave Desert, windbreak planting ... 202
rice growing in Sutter County ... 47
Scott Valley's history of ranching ... 246–247
stubble mulching on hillsides ... 39
Urban Sprawl Brings Conservation Problems. Fred W. Herbert ... 148–150
Vya SCD serves California and Nevada ... 116–117
water is gold ... 16–17
Cape Fear River (N.C.), progress in 1961 ... 163
CARLSON, CARL W.: Soil and Water Research Spans a Century ... 257–258
Carlton, Keith, gets fuller use of irrigation water (Ariz.) ... 34–35
Cartography, progress in 1961 ... 165
Cayko, Andrew, irrigated 65 acres through conservation ... 77

Page

Census of Agriculture source for Needs Inventory ... 221
Changing Great Plains. Picture Story ... 84–85
Chemical and Natural Control of Pests: Review by B. D. Blakely ... 77
Chemicals vs. the Hoe in Windbreak Plantations. Walter T. Bagley ... 46
Childers, Thomas H., worked out plant plan (Ariz.) ... 203
Children's Forest at Ewing Park, Iowa ... 283
Coastal Bermudagrass Proves Self in West. Ray W. Bates ... 203
Coastal Plain, most of Georgia's row cropland in ... 28
COLBURN, W. LEE: Mulch Tillage Stops Harvest—Ends Smoke Signals ... 38–39
Colorado—
  conservation turns up side benefit ... 86
  Adolph Hansen, District Profile ... 66–68
  Don Hill, District Profile ... 107
  high-quality hay harvested on White River ranch ... 54
  River Storage project, progress in 1961 ... 163
  Tree Plantings Multiply Game and Song Birds. W. S. Swenson ... 183–184
Colton, J. W., watershed project reduces road and bridge maintenance (Ark.) ... 316
Colyn, John, conservation class first accredited class (Kans.) ... 285
Community Action in West Virginia. Gordon S. Smith ... 140–141
Compaction, soil ... 31–32
COMPTON, LAWRENCE V.: Review of American Wildlife and Plants, A Guide to Wildlife Food Habits ... 192
Connally, Merrill, John, and Wayne, planted peanut land to coastal bermudagrass (Tex.) ... 129
Connecticut—
  "Duck man" Bucks Wildlife Shutout. Theodore W. Pawlowski ... 175
  planners use abbreviated soil map ... 150
Conservation—
  cropping—
    makes full use of water ... 35
    System Works for Arizona Farmer. Mervin H. Wallace and Walter E. Parsons ... 34–35
  education—
    A Woman's Way in. Milton E. Bliss ... 282–283
    exposed to Milwaukee school children ... 278
    factor in Messler's career (Tenn.) ... 270
    in the Classroom and Afield. Donald A. Williams ... 267
    materials provided by Audubon Junior Program ... 272
    to develop appreciation of all resources ... 283
  Farmer, Retired Judge Turns To. Clifford Novosad and Marshall H. Nichols ... 93
  farming—
    learned by students. Cover picture ... [266]
    Overcomes Southeast's Centuries-Old Problems: T. S. Buie ... 244–245

Conservation—Continued
Page

  farm plan makes farming easier (Mich.) ... 111
  Help, Non-farmers in Pittsburgh Area Seek Most. William Lucas and Joseph A. Krivak ... 156–157
  Helps Lick Sedimentation Bugaboo. John N. Holeman ... 260–262
  Improvement, One Hay Crop Pays For. Wayne Sanderson ... 54
  Increased Through Classroom Teaching. Gene F. Bohnenblust and Daniel E. Holmes ... 285–286
  Institutes, teacher (Nebr.) ... 273–274
  Job, Nation, Ahead, 30,000 People Helped Measure. John W. Bernard ... 220–221
  Kids Cartoons Liven, Interest. James L. Woodard and Louis J. Dondero ... 281–282
  Legislation Sparked by "Dust Bowl." Marvin Jones ... 252–253
  Links, Octogenarian Village Blacksmith Forges. R. C. Barre ... 254–255
  Message To Congress by John F. Kennedy ... 240
  movement takes over in Scott Valley (Calif.) ... 247
  Needs—
    Figures Welcomed in Carolinas. Sellers G. Archer ... 232–233
    Information Speeds River Basin Planning. Frank R. Brower ... 239
    Inventory—
      brought into focus what has to be done in Great Plains ... 231
      Face Lifting B for manmade Wrinkles on the Land. T. C. Green and T. A. Neubauer ... 221–223
      gives county-by-county report ... 221
      indicates size of farm and watershed conservation to be done (Calif.) ... 230
      points up water importance in N.Y., Vt., N.H., and Maine ... 237
      progress in 1961 ... 161–162
      provided basis for Springfield master plan ... 233
      shows changes in Rhode Island ... 226–227
      shows much cropland should be shifted to less intensive use ... 229
      shows urban and rural development ... 235–236
      used by farmers (Ky.) ... 223
      used by industry and organizations (Wis.) ... 224
    Measured. Donald A. Williams ... 219
  outdoor teaching museum (N.J.) ... 276–277
  Outdoor, Young Campers Learn About. P. H. Bedanbaugh ... 174–175
  part of science teaching by TV (Tenn.) ... 287
  practices—
    altered to fit farm machinery ... 61
    as contour stripcropping and grassed waterways. Cover picture ... [26]
    soil, sells more machinery (Tex.) ... 119
  ranch plan for range improvement (Utah) ... 103
  Rejuvenates Them, People Make Lakes, "Grow Old". Nils P. Dahlstrand ... 172–173
  Reserve Program—
    getting poor cropland into grass (Tex.) ... 88

Conservation—Continued Page
resulted in grass and legume seeding for wildlife (Wash.) 115
used in Great Plains 75
Saves Tax $$ on Institution Farms. Leon J. McDonald and John O. Helein 105–106
Star Farmer of America Schooled in. Leon J. Sisk 269–270
system and old rail fences (W. Va.). Cover picture [242]
Takes Gamble Out of Wyoming Ranch operation. Albert P. Thatcher and Brent J. Harrison 79–80
Teaching Geared To Everyday Community Life. Arthur W. Emerson 279–280
teaching in schools No. 1 item (Tex.) 275
Teaching, Milwaukee Schools Go All Out For. Marvin Schweers 278–279
Teaching Teachers To Teach Resource. Raymond S. Brown 268–269
Technologies, New, Work in New State. Archibald E. McCabe 56–57
Technology and Machines Speed. Donald A. Williams 51
The Next 25 Years 264
training center for teachers (N. Dak.) 271
Truck Farm, From Backyard Garden To. Marvin F. Bureau 284–285
TV Brings, into Tennessee Classrooms. Grace Batson 287–288
under GPCP better crops and grass (Tex.) 78
Village Forest, Means More Water for Power. Lester Fox 190
Watershed Management Restores Creek Flow. Don Wilbert 186–187
Conserving Runoff Water With Zingg Bench Terrace. Victor L. Hauser 90–91
Contest, World Plowing unveils ("Cairn of Peace") (Ohio) 254
Contour cultivation stores extra foot of water 7
Cooper, A. W.: Cutting Down on Cropland Soil Compaction 31–32
Corbett, Lawrence, and sons, properly managed irrigated pasture (Wyo.) 89
Corps of Engineers helps control Trilby Wash floodwaters (Va.) 127
Cover crops good insurance against soil blowing (N. Dak.) 30
Cox, James R.: 75,000 Minnows an Acre 8–9
Crisman, Eugene F.: "You Can't Level That Land" But Idaho Farmer Did 62–63
Cropland(s)—
Conservation. D. A. Williams 27
needs conservation treatment 222
soil compaction, cutting down on
Cude, William, made planter to get uniform planting job 58

Dahlstrand, Nils P.: People Make Lakes "Grow Old" Conservation Rejuvenates Them 172–173
Dams built with carryalls (Calif.) 16
Darby, Gerald M.: Made-over Machines Work 58
Davis, David O.: Teacher Conservation Institutes Bring County People Together 273–274
Delaware River, progress in 1961 163
Dempsey, Jack, Congressman, introduced expanded wind and water erosion bill, 1935 252
Denley, Jack and Joe, build irrigation reservior behind dam (Oreg.) 191
Desert Spring Development—Indian Ponies to Dozers. Ralph E. Bishop 55
Design and construction in 1961 167
Dewing, J. A., picks stones off his fields (Vt.) 139
Dicken, Tom, D.: Harvest Those Grass Waterways 12–13
Dirickson, Doyle, granted right-of-way for bridge (Okla.) 128
District Program Restores Ghost Land. D. J. Johnson 137–138
District(s)—
Profile. *See* Profile, District
Soil Conservation. *See* Soil Conservation Districts
Ditch(es)—
hillside, represented first erosion control effort 244
Lining Saves Water—Pays. Rex Richetts 68–69
Dondero, Louis J.: Kids' Cartoons Liven Conservation Interest. With James L. Woodard 281–282
Dougan, W. J., Ronald, and Mrs., inscribe aims on silo (Wis.) 248
Douglas, Donald S.: Crownvetch—New Pasture Legume. With Virgil B. Hawk 206–207
Drainage progress in 1961
Draintile made irrigating meadows possible 54
Drought-defying Conservation Farmers Report. Tarleton Jenkins 76–77
Drown, Solomon. Quotation on adapting crops to soil [26]
DuBose, F. E., of South Dakota, District Profile. J. E. Earle 24
Dust Bowl covered parts of five SW States 252

Earle, J. B.: District Profile, F. E. duBose of South Dakota 24
Early GPCP Contract Brings Many Benefits: James D. Abbott 78–79
Earthmoving largest in State (S. Dak.) 64
Easton, Gerald W.: A Half-Century of Soil Stewardship by This Wisconsin Family 248–249
Edminster, Frank: Review of Weed Control: As a Science 215–216
Education. *See* Conservation Education
8,000 Acres in Woody Plantings for Nebraska Wildlife. Charles V. Bohart 214–215
Emerson, Arthur W.: Conservation Teaching Geared to Everyday Community Life 279–280
Engineering progress report in 1961 166–167
Equipment—
Machinery. *See* Machinery.

Page

Erosion—
control practices, progress in 1961 166–167
of shoreline 172
Sand—Plants To the Rescue. Wilson O. Hill 199–200
Evans, Charles A.: 2,000 North Dakota Teachers Study Conservation 271
Extension Service—
believes conservation education encourages citizens to contribute effort to conserve resources 288
cooperated in getting better farming practices on watershed 131
created in 1914 243
helps locally in RAD 135
holds herbicide demonstration 46
supplements formal school resource education by educational activities 267

Fairchild, Warren D.—
meeting hatched idea of institutes (Nebr.) ... 274
states small-watershed program means less costly recreation reservoirs 180
Farm(s)—
and ranch planning, progress report, 1961 165
Credit Bank purchased S.C. Needs Inventory. 233
New Uses for Old. Gordon S. Smith 177–178
Old, Stays Proudly on in Megalopolis' Path. David A. Bennett 262–263
Farmer(s)—
does more soil building than grandfather (Colo.) 107
Home Administration—
advises SCS make topographic survey (Mont.) 92
closes loan because of watershed program (Ark.) 136
helps make use of ACP resources 228
lends in Great Plains 75
purchased S. C. Needs Inventory 233
Farrar, Jack, pioneered seed-producing effort ... 197
Feed "Em and Reap." W. N. Parmeter 94
Feist, Joe and Curtis, boosters of tame-grass pastures (N. Dak.) 87
Ferris, J. D., wants SCD help (Okla.) 105
Fibich, W. R. $1,000 Orchard Waterway, Job Is Paying Off 71
Finlay, Robert, R., gets resource education into schools (Ohio) 268
Fischer, Oryl L. Grass Is Key To Rural Areas Improvement 142–143
Fish—
and Fowl and Fine Black Angus. Burrell D. Osburn 184
and wildlife, small watershed projects, 1961 .. 166
ponds for rainbow and brook trout 178
profitable up to 75,000 shiners an acre 8
Story—Plus. Arland W. Andrews 191
Fish and Wildlife Service—
helps with training center (N. Dak.) 271
Monomoy Refuge cooperates in plantings 200
pays for tree-planting stock (Colo.) 183
Fishel, Lavern, volunteers SCD services 101

Page

Fishing Tourists Need Bait, N. Mex. "Fish Farmer" Obliges. Ralph N. Bell 185
Flood(s)—
Prevention Dam Brings Outdoors to Kids. Wayne M. Hypes 187–188
prevention progress in 1961 162–163
Problem Solved by Group Action. D. C. Hadfield and Alvin Kranzler 17–18
Florida—
effective water management system 21
Plant Material Center on soils typical of "flatwoods" (Arcadia) 204
river basin development speeded by Needs Inventory 239
Ford, Charles W.: Kentucky Watershed's Farmers Count on "Needs" Information 223
Forest Service—
aids soil conservation districts 109
cooperated on tree planting (Ill.) 131
gives all citizens best information 153
gives helping hand to teacher Baucum 280
helped with forest management (W. Va.) 140
landowners using grass-vegetable rotations ... 158
permits part of ranch operation 104
purchased S. C. Needs Inventory 233
supplements formal resource education by educational activities 222
Timber Resources Rev. source for Needs Inventory 222
Fox, Lester—
Rural Area Development at its Best 124–125
Village Forest Conservation Means More Water for Power 190
Freeman, Orville L.—
calls Land and People Conference 182
commited USDA to make new RAD dreams come true 133
said Mountain Run project shows what people and USDA can accomplish 124
Frey, Charlie, made a slipform for concrete ditch lining (Nev.) 69
Fuller, Ellis, harvested seed (Idaho) 196

Gage, R. T., supplier of minnow bait (N. Mex.) .. 185
Garner family have profitable minnow business. 8
Garrison Creeping Foxtail—Grass for Wetlands. John McDermand and Jesse L. McWilliams. 211–213
Garvey, Glenn D.: Centennial of Stripcropping 255–256
Geology in 1961 167
Georgia—
built sewage treatment plant and campsites .. 182
Farmers Like Grass-Based Rotations. L. R. Payne 28–29
Lake Newman Reservoir sediment reduced by conservation measures 260
people move to meet urban problems 154
river basin developed speeded by Needs Inventory 239
Sautee Creek project also for recreation 65
shifts in land use 245
Girl Scout camp Nacoochee Valley lake (Ga.) .. 65
Gomes, Clarence. clear farm for pasture 56

Page

Graham, G. R., stated S. C. Needs Inventory a fine publication ... 233
Graham, James, grew crops in grass for 5 years ... 29
GRANDPRE, LEO: More Ducks—Birds—Beauty ... 179
Grass(es)—
alfalfa and Ladino on rock-free pasture ... 59
Along the Bitterroot. C. A. Rose ... 259–260
chart ... 201
coastal bermuda used in grassland farming ... 129–130
conversion to permanent, GPCP ... 82
cover used on low-grade cropland (Tex.) ... 88
crops importance in American agriculture ... 195
farm converted from cropland (N. Y.) ... 100
for shallow shale soils ... 210
for wetlands, Garrison creeping foxtail ... 211–212
From Brush To. Homer A. Taff ... 88–89
Improvement Benefits Ranchers and Community. A. L. Hafenrichter ... 196–197
Is Key To Nebraska Rural Area's Improvement. Oryl L. Fischer ... 142–143
Ladino, small brome, orchard, alta fescue used ... 63
pangola, big treefoil, clover planted (Hawaii) ... 57
planted, coastal and common bermuda (Tex.) ... 93
+ Water = Beef x Pounds. Charles Reagin ... 86–87
poster, How Grass Makes Food for Growth ... 216
Rotations Boon to Florida Vegetable Business. C. B. Blickensderfer ... 158
see Plants.
seed distributed (N. Dak.) ... 198
seed of 20 odd species major cash crop (Tex.) ... 207
tall wheatgrass for "salty" land (Nev.) ... 213
tame produced by waterspreading (N. Dak.) ... 22
tested (R. I., Mass.) ... 199–200
used in crop rotations (Ga.) ... 28
Waterways, Harvest, Those. Tom D. Dicken ... 12–13
wheat, intermediate (Wyo.). Cover picture ... [194]
GRAY, RICHARD I.: Mechanical Post Peeler Leads to Good Land Use ... 69–70
Great Plains—
changing. Picture story ... 84–85
Conservation Program—
controlling brush (Tex.) ... 88
cost-sharing ... 243
cost-sharing helps build dam and spillway ... 871
cost-sharing helps farmers and ranchers ... 651
designed for conservation problems (Nebr.) ... 142
discussed by Frank J. Welch ... 83
Donald A. Williams ... 75
ends wind erosion, first contract (Tex.) ... 78
helped by grass supplies (Tex.) ... 208
progress in 1961 ... 164
South Dakota farmers survive drought ... 76
speeds up conservation work (Wyo.) ... 80
takes hazardous lands out of cultivation ... 81
through soil conservation districts ... 109
way to get complete conservation faster ... 86
Pinpoints Conservation Needs. Cyril Luker ... 231
Program for the. Cyril Luker ... 81–83
Something Different on the. James E. Smith, Jr ... 207–208

Page

Greely, Horace, plow quotation ... 54
GREEN, T. C.: Needs Inventory—Facelifting B for Manmade Wrinkles on the Land. With T. A. Neubauer ... 221–223
Green Thumb Works in "Thumb of Michigan." L. W. Kellogg ... 29–30
GROGGER, HAROLD E.: A City Looks to the Soil ... 233–234
GUERNSEY, WALTER J.: Kentucky Farmers Go for Grass Cover Crops ... 42–43
Gully—
erosion. Cover picture ... [218]
Man K.O's, in Three Rounds. George R. Smith and Grant Woodward ... 9
Gunnison River (Colo.), progress in 1961 ... 163–164

Haas, Everett, Tod, build plow for "Cairn of Peace" ... 254–255
Hackamacks, John, Paul, and Carl, irrigating ... 16
HADFIELD, D. C.: Flood Problem Solved by Group Action. With Alvin Kronsler ... 17–18
Halbert, Grady, boosts GPCP (Tex.) ... 89
HARRISON, BRENT J.: Conservation Takes Gamble Out of Ranch Operation. With Albert P. Thatcher ... 79–80
Harvest those Grass Waterways. Tom D. Dicken ... 12–13
HAUSER, VICTOR L.: Conserving Runoff Water With Zingg Bench Terrace ... 90–91
Hawaii—
irrigated separated from other cropland ... 222
ranchlands given conservation practices ... 56
HAWK, VIRGIL B.: Crownvetch—New Pasture Legume. With Donald S. Douglas ... 206–207
Hay—
and pasture on strip-mine land (W.Va.) ... 67
cut from waterways (Kans.) ... 12
produced by waterspreading (N. Dak.) ... 22
HAYNSWORTH, HARRY J.: Better Plants and Pastures for Florida's "Flatwoods." With C. B. Blickensderfer ... 204–205
Hays, P. L., farm-produced food saves money ... 105
Head, W. V., recommended grass-based rotations ... 29
HELEIN, JOHN O.: Conservation Saves Tax $$. With Leon J. McDonald ... 105–106
Hemond, Roland, bought land leveler (Maine) ... 53
HERBERT, FRED W.: California's Urban Sprawl Brings Conservation Problems ... 148–150
Heritage, Carlton and Howard, plant orchard on contour (N.J.) ... 45
HERMAN, DAN L.: Timing Key to Irrigated-Pasture Management ... 89–90
Hiatt, Clyde, a lot of water needed for cannery ... 136
High, Jeff, closed loan because of watershed program (Ark.) ... 136
HILL, EDWIN: Wisconsin Shows How Needs Reports Can Be Used ... 224–225
HILL, WILSON O.: Sand Erosion—Plants To the Rescue ... 199–200

	Page
History of—	
Bitterroot Valley area	259
"Cairn of Peace"	254
George Washington's herring fishing	173
ranching and mining in Scott Valley	246
sedimentation bugaboo	260–262
soil and water conservation	243
soil and water research	257–258
soil conservation 25 years ago	[122, 146, 170, 194, 218, 242, 266]
Southeast's centuries-old problems	244–245
tile drainage (N.Y., Md.)	250–251
250-year old farm (N.H.)	262–263
HOLDEN, CHARLES A., JR.: Owner-Renters and Landlords Profit from SCD Program	112–113
HOLEMAN, JOHN N.: Conservation Helps Lick Sedimentation Bugaboo	260–262
HOLMES, DANIEL E.: Conservation Increased Through Classroom Teaching. With Gene F. Bohnenblust	285–286
Huggins, Allen G., and Mrs., tell of uses made of their farm (N.H.)	262
HULTGREEN, JOHN. Yule Trees for Christmas (Wash.)	102–103
Humboldt River (Nev.), progress in 1961	163
Hundt, Hubert, farm of stripcropping (Wis.)	256
Hydrology in 1961	167
HYPES, WAYNE M.: Flood-Prevention Dam Brings Outdoors To Kids	187–188
Idaho—	
annual grass tour community event	196
Nampa, land leveled and drained	63
Plant Materials Center furnished tall wheatgrass seed (Aberdeen)	213
snow surveys made by SCS. Cover picture	[97]
story of man's interference with beavers	188
Big Blue Creek project ends water worries	130
Illinois has watershed campsite and increased wildlife	182
Indiana lake formed in Elk Creek watershed	182
Introduction to Soil Microbiology. Review by Charles E. Kellogg	72
Iowa—	
Deer River watershed provides outdoor benefits	181
Emerald crownvetch released by SCS and Experiment Station	207
students become interpreters of outdoors	283
Irrigation—	
circulating system uses waste water (Wash.)	11
of pastures aim in Bitterroot Valley (Mont.)	259
of pastures, more lambs and mutton (S. Dak.)	94
progress in 1961	167
water controlled by borders and corrugation (Nev.)	138
water used fuller (Ariz.)	34
Irrigator Stays with His Farm. O. Wendell Thacker	92
Jackson, Henry A., has tile land before World War I	250
Jacob, Joe, improves hunting conditions (Utah)	176
JEFFORDS, OLIVER D.: Problem Waste Water Turned Into Asset	11
JENKINS, TARLETON: Drought-defying Conservation Farmers Report	76–77
JESSUP, GEORGE L.: SCD Programs Mean Better Hunting-Fishing. With Charles L. Limeberry	113–115
JOHNSON, D. J.: District Program Restores Ghost Land	137–138
JOHNSON, MARTIN L.: Watershed Research for the Northeast Points Up Water Needs	237–238
Johnston, John, father of tile drainage (N.Y.)	258
JONES, HERBERT I.: Waterspreading Puts More Raindrops to Work	22–23
JONES, MARVIN: Conservation Legislation Sparked by "Dust Bowl"	252–253
Kadrmas, Alfred and George, planted wildlife cover, trees, and shrubs (W. Va.)	179
Kansas—	
Bern farmer corrects gully	9–10
Cimarron area free of floodwater plague	95
farmers harvesting grass waterways	12
landowners - operators - renters benefit from SCD	112
Little Delaware-Mission Creeks watershed provides water for wildlife	182
McPherson, schools offer conservation course	285
technicians assemble data on soil	233
Karr, Calvin, modified lister plow	58
KELLEY, OMER J.: Soil Evaporation Is a Major Loss	14–16
KELLOGG, CHARLES E.: Review of Introduction to Soil Microbiology	72
KELLOGG, L. W.: Green Thumb Works in "Thumb" of Michigan	29–30
Kennedy, John F.—	
message to congress on conservation	240
quotation on water	[2]
Kentucky—	
Farmers Go for Grass Cover Crops: Walter J. Guernsey	42–43
increased fishing from Plum Creek watershed	180
Watershed's Farmers Count on "Needs" Information. Charles W. Ford	223
Kids' Cartoons Liven Conservation Interest. James L. Woodard and Louis J. Dondero	281–282
Kirkeby, Gordon and Kay, try tall wheatgrass	213
Knauss, William, 1961 wheat yields increased	76
KONIECZNY, EDWARD: Picking Rocks Easier With Steel Fingers	59
KORTON, STEVE: Water Conservation a Key to South Dakota Progress	6–7
Kramer, August and Herbert, soil proof possible to keep land "new"	255
KRANZLER, ALVIN: Flood Problem Solved by Group Action. With D. C. Hadfield	17–18
Kring, W. N., dams now protect their property	128

KRIVAK, JOSEPH A.: Non-farmers in Pittsburgh Area Seek Most Conservation Help. With William Lucas ... 156–157
KUFFER, ADRIEN: Stubble Mulching for California's Hillside Fields ... 39–40

Lachicotte, George, believes in mulch tillage ... 39
Land—
Leveling Leveling "Down East" in Maine. Leroy M. Bingham ... 52–53
of Plenty the American Farm Story. Review by Gladwin Young ... 263
treatment, progress report, 1961 ... 165
Land use—
shifts from 1958-to-1975 ... 222
shifts in (Ala., Ga., Miss., N.C., S.C., Tenn., Va.) ... 245
statistics unique in Conservation Needs Inventory ... 219
Laramy, Robert E.: The Face of Rhode Island a Dozen Years Hence. With Bernhard A. Roth ... 226–227
Legume(s)—
Crownvetch—New Pasture: Virgil B. Hawk and Donald S. Douglas ... 206–207
provides cover on soil and spoil bank ... 209–210
LEIBY, MARION G.: Farming History in Old Tile. With M. M. Weaver ... 250–251
LIMEBERRY, CHARLES L.: SCD Programs Mean Better Hunting-Fishing. With George L. Jessup ... 113–115
LIND, C. F. Water Management Remakes Muck Pasture ... 21–22
LOUDERMILK, HAROLD: Mojave Desert Windbreaks ... 202
Louisiana businessman gives up his town business for year-round summer home ... 181
Lounsbury, Bill, pioneer producer of Emerald crownvetch (Iowa) ... 206
Lower Mississippi River and Tributaries, progress in 1961 ... 163
Luben, Wayne, harvest high quality hay ... 54
LUCAS, WILLIAM: Non-farmers in Pittsburgh Area Seek Most Conservation Help. With Joseph A. Krivak ... 156–157
Luker, Cyril—
A Program for the Plains ... 81–83
Great Plains Pinpoints Conservation Needs ... 231

Machinery—
bulldozer leveling for reservoir (Calif.) ... 55
bulldozer and carryall levels land (Idaho) ... 63
cultivator, sprig planter, harvester used ... 57
development of farm implement and earth-moving machines ... 51
land leveler does many jobs (Maine) ... 52
land plane operated by Heath (Oreg.). Cover picture ... [50]
mechanical post peeler (Wyo.) ... 69–70
tillage and other equipment altered and fitted to land ... 60
tractor equipped with rock rake clears rocks ... 59
Made-over Machines Work. By Gerald M. Darby ... 58
Maine—
water importance in findings of Needs Inventory ... 237
well-drained land for good pastures and hay ... 52
Maloney, Mike, tile lines on a homesite (N.H.) ... 159
MARION, HOMER W.: Water Is Gold ... 16–17
Marsh, Elbert, stubble mulch reduces soil losses ... 39
Marti brothers control persistent gully (Kans.) ... 9–10
Maryland—
area strip mine spoils solved by conservation ... 209–210
Gunpowder Falls watershed reduces sediment yield to Loch Raven and Prettyboy ... 260
strip mining results in bare slopes ... 209
tile drainage history ... 250–251
MASON, LEMAR R.: Womenfolk Get in on Soil Conservation District Act ... 103–104
Massachusetts—
farming is land and resources management ... 191
rock-combing equipment used ... 59
sandblow field evaluation planting observed ... 200
W. E. Fernald State School's conservation saves taxpayers money ... 106
Massie, Lewis, uses desert springs to water stock and irrigate (Calif.) ... 55
Mathews, E. B., leaves cornstalk rows for wildlife (Va.) ... 41
Mathews, Pop, and Pinky Bill, tell about Matt and settling in Scott Valley (Calif.) ... 246–247
Mauer, Floyd, and David, parlay garden into larger truck farm (Ohio) ... 284
McCABE, ARCHIBALD E.: New Conservation technologies Work in New State ... 56–57
McDERMAND, JOHN—
Garrison Creeping Foxtail—A New Grass for Wetlands. With Jessie L. McWilliams ... 211–212
Trees for North Dakotas Future. With Otis Tossett ... 197–198
McDONALD, LEON J.—
Conservation Saves Tax $$ on Institution Farms. With John O. Helein ... 105–106
Teamwork Saves a Bridge ... 128
What a Typical SCD Leader Does—Gratis ... 101
McLeod Campbell, welcomes conservation campers (S.C.) ... 175
McWILLIAMS, JESSIE L.: Garrison Creeping Foxtail—A New Grass for Wetlands. With John McDermand ... 211–212
Mechanical Post Peeler Leads To Good Land Use. Richard L. Gray ... 69–70
Meet Mr. Beaver—Engineer and Conservationist. Kenneth E. Riergard ... 188–189
Megalopolis the Urbanized Northeastern Seaboard of the United States: Review by Henry R. Adams ... 168
Messler, James, parlayed grubstake to farm (Tenn.) ... 269
Meyers, Paul, licks resort erosion (Wis.) ... 173

Michigan— Page
Counties Use Soil Surveys to Measure Needs. Glenn Bedell 235–236
proper soil management improves yields 29–30
soil conservation district way (Eaton County) 111
MILLER, SHIRLEY.: 10 Million Young Conservationists 272–273
Minnesota—
Braille School uses Audubon Junior Program 273
permanent wildlife area in Shakokee Creek watershed 182
MINNICH, E. R.: Soil Management Boosts Wildlife 41
Mississippi, shifts in land use 245
Missouri—
G. S. and Dolores Montgomery, District profile 144
Springfield, working on a general plan 233
Montana—
Bitterroot Valley areas destiny in better pastures 259
Garrison creeping foxtail for mountain meadows 211
irrigator uses siphon tubes 92
MONTGOMERY, P. H.: Review of Our Soils and Their Management 96
More Ducks—Birds—Beauty. Leo GrandPre 179
Morris, C. F., grew tobacco and cotton in coastal and bahia sods (Ga.) 28

Nagy, Frank, follows soil and water conservation plan (Mich.) 30
Naugle, Wayne, leveled and drained his land 63
Nebraska—
herbicides for unwanted weeds 46
range management pays grass dividends. Cover picture [74]
schools benefit from County Teacher Conservation Institutes 273
Sherman County to prove rural communities can help themselves economically 142
Wildlife, 8000 Acres in Woody Plantings. Charles V. Bohart 214–215
Nelson, Albert, and family, benefit from farming soil conservation way (Mich.) 111
NEUBAUER, T. A.: Needs Inventory—Face-lifting for Manmade Wrinkles on the Land. With T. C. Green 221–223
Nevada—
desertland becomes conservation showplace 137
Fallon, irrigated ditches concrete-lined 68
Land Responds To Grass Improvement: Aage S. Topholm 212–213
Vya SCD serves Nevada and Calif 116–117
New Hampshire—
farm undergoes many changes in 250 years 262–263
farmer turned seep water into multipurpose benefits 159
water importance in findings of Needs Inventory 237
youngster writes conservation definition 272

New Jersey— Page
contour-planted orchard, Gloucester Co 45
farm boys getting better trapping hauls. Photographs 120
Outdoor Nature and Scouting Museum 276
New Mexico, farm supplies minnow bait 185
New York—
cropland converted to grass 100–101
Plant Materials Center develops and supplies seed for testing 199
tile drainage history 250–251
water importance in findings of Needs Inventory 237
NICHOLS, MARSHALL H.: Retired Judge Turns Conservation Farmer. With Clifford J. Novosad 93
North Carolina—
drew upon Conservation Needs Inventory 232
Highpoint Reservoir sediment yield reduced by conservation measures on watershed 260
river basin developed speeded by Needs Inventory 239
shifts in land use 245
North Dakota—
better production from tame-grass pastures 87
farmer-run nurseries, Oakes and Ft. Lincoln 197
Garrison creeping foxtail for potholes and swampy areas 211
recreational development at Renwick Reservoir 182
spreader dike system success 22
2,000 Teachers Study Conservation. Charles A. Evans 271
turning barren land into land for wildlife 179
NOVOSAD, CLIFFORD J.: Retired Judge Turns Conservation Farmer. With Marshall H. Nichols 93

Ohio—
coal company uses crownvetch 206
Education Department hires conservation education supervisor 268
mulching 40
Peebles, host to 5th World's Conservation Exposition and Plowing Contests 254
soil maps used in selecting land 284
surface-water problem stopped by wheel-track planting 43
Oklahoma—
experiencing watershed recreational and wildlife boom 181
SCD leader volunteers services 101
State Institutions being fed better at less cost to taxpayers 105
supervisors and county commission do a bridge-saving job 128
technicians assemble data on soil 233
Olson, Arnold, conservation increased flax yield 76
Olson, family, believe grass is best used for their land (Nebr.) 143

O'Quinn, Morris, watershed program can supply industry water (Ark.) — Page 136
Orchards on the Level! Joseph J. Voschin — 45–46
Oregon—
irrigation reservoir multiplies wildlife and recreation — 191
high school has conservation course geared to community — 279–280
operating a land plane. Cover picture — [50]
OSBURN, BURRELL D.: Fish and Fowl and Fine Black Angus — 184
Our National Park Policy. Review by D. Harper Simms — 192
Outdoor beauty, Richmond, R. I. Cover picture — [169]

PARMETER, W. N.—
Feed' Em and Reap — 94
Now Can Sleep Nights—Gets High Wheat Yields — 33
PARSONS, WALTER E.: Conservation Cropping System Works for Arizona Farmer. With Mervin H. Wallace — 34–35
Pasture(s)—
and range included in Needs Inventory — 222
Irrigated, Timing Key to! Dan L. Herman — 89–90
muck remade by water management (Fla.) — 21–22
seeded to alfalfa and brome (Kans) — 113
Tame, Works, for Father-Son Team. Donavon E. Broberg and Gene L. Williams — 87
PAWLOWSKI, THEODORE W.: Connecticut "Duck Man" Bucks Wildlife Shutout — 175
PAYNE, L. R.: Georgia Farmers Like Grass-Based Rotations — 28–29
PEARCE, IRVING F.: Rice Likes Wet Feet — 47
Perhus, Kermit, uses waterspreader dike system — 22
Pennsylvania—
area strip mine spoils solved by conservation — 209–210
Montgomery County urbanization. Cover picture — [146]
Pittsburgh, request for assistance increase other than landowners — 156
PETTIT, TED S.: Boy Scout Nature Museum Outdoor Conservation Classroom — 276–277
Petty, Robert, farm example of how conservation measures improve wildlife (Calif.) — 115
Pheasant, George, converted waterway into orchard (Wash.) — 71
Picking Rocks Easier With Steel Fingers. Edward Konieczny — 59
PLAIR, T. B.: Review of The Small Private Forest in the United States — 143
Plans, conservation, increase yields — 47
Plant(s)—
and Pastures for Florida's "Flatwoods," Better. Harry J. Haynsworth and C. B. Blickensderfer — 204–205
Community. Review by Robert E. Williams — 119
crownvetch ground cover and erosion controlling — 206
for soil and water conservation, progress, 1961 — 166
Plant(s)—Continued
Materials— — Page
Basic To Soil and Water Conservation. Donald A. Williams — 195
Center, Aberdeen, supplies seed (Idaho) — 196
Center, Bismarck, working on new tree species (N. Dak.) — 198
Center, National, progress in 1961 — 166
New, for Alleghenies' Strip Mine Spoils and Shale Soils. Joseph D. Ruffner — 209–210
technology, progress report, 1961 — 165–166
woody, conserve wildlife (Nebr.) — 214
Plow(s)—
depth layer location — 31
18th Century Norfolk model for plowsmen — 254
To Fit the Land—Land To Fit the Plows. Gerald E. Ryerson — 60–62
Potomac River, progress in 1961 — 163
Principles of Plant Breeding. Review by A. D. Stoesz — 215
Production and Marketing Administration funds help build dam (Va.) — 126
Profile, district—
F. E. DuBose of South Dakota. J. B. Earle — 24
Adolph Hansen of Colorado. Carl R. Ward — 67–68
Don Hill of Colorado. Ellis F. Sedgley — 107
G. W. and Dolores Montgomery of Missouri. Lee Bowen — 144
Programs, contributing to sound rural areas development — 160
Puerto Rico, irrigated separated from other cropland — 222

Radio active materials used — 258
Raisch, Robert, lists windbreak injuries (Kans.) — 35
Ramminger, Ray, draws on help for lake (Wis.) — 173
Ramos, Ernest and Jordon, planted pastures to grass (Hawaii) — 56
Rangeland managed for full potential — 116
REAGIN, CHARLES:
Grass + Water = Beef × Pounds — 86–87
Recreation—
ages St. Germain Lake (Wis.) — 172
and flood protection accomplished by watershed project (Ga.) — 65
developed by Big Blue Creek project (Ill.) — 130–131
development, Prudence Island (R.I.) — 227
for enjoyment of our people — 171
low-capability shift to — 161
needs identified in Needs Inventory — 222
planning assistance, Pittsburgh area (Pa.) — 156–157
provided by South River dam (Va.) — 187
see Rural, Rurbanization, Soil Surveys, Urbanization, Wildlife
State camp for conservation (S.C.) — 174
REIPL, GERALD R.: No More Floodwater for Cimarron — 95–96
Renouf, Henry, claims farming is land and resource management — 191
Report of the Administrator, SCS, 1961 — 160–167
Research—Series—
No. 64. Soil Evaporation Is a Major Loss. Omer J. Kelley — 14–16

Research—Series—Continued Page
No. 65. Cutting Down on Cropland Soil Compaction. A. W. Cooper ... 31–32
No. 66. Conserving Runoff Water With Zingg Bench Terrace. Victor L. Hauser ... 90–91
No. 67. Watershed Research for the Northeast Points Up Water Conservation Needs. Martin L. Johnson ... 237
Reviews—
American Wildlife and Plants, A Guide To Wildlife Food Habits. By Alexander C. Martin, Herbert S. Zimm, and Arnold L. Nelson ... 192
Chemical and Natural Control of Pests. By Dr. E. R. deOng ... 72
Introduction to Soil Microbiology. By Martin Alexander ... 72
Land of Plenty the American Farm Story. By Wheeler McMiller ... 263
Megalopolis the Urbanized Northeastern Seaboard of the United States. By Jean Gottmann ... 168
Our National Park Policy. By John Ise ... 192
Our Soils and Their Management. By R. C. Donahue ... 96
Principle of Plant Breeding. By R. W. Allard ... 213
Seeds: The Yearbook of Agriculture. U.S. Department of Agriculture ... 47–48
Soil Conditions and Plant Growth. By E. Walter Russell ... 48
The Plant Community. By Herbert C. Hanson and Ethan D. Churchill ... 119
The Small Private Forest in the United States. By Charles H. Stoddard ... 143
Weed Control: As a Science. By Glenn C. Klingman. Editorial assistance by Lyman J. Noordhoff ... 215–216
Wilderness, America's Living Heritage. Edited by David Brower ... 192
Rhode Island—
Carolina State Reservation. Cover Picture [169]
Changes indicated in Needs Inventory ... 226–227
Face of. Bernhard A. Roth and Robert E. Laramy ... 226–227
more than 200 species of grasses, shrubs, and trees established ... 199
Rice Likes Wet Feet. Irving F. Pearce ... 47
RICHARDS, WILLIAM E.: Conservation Districts in Action ... 108–109
RICKETTS, REX.: Ditch Lining Saves Water—Pays ... 68–69
REIRGARD, KENNETH E.: Meet Mr Beaver—Engineer and Conservationist ... 188–189
Rigdon, John, behind watershed undertaking ... 154
River-basin activities in 1961 ... 163–164
Room for Outdoor Development Demonstrated in Wide-Open West. D. S. Winn ... 176–177
ROSE, C. A.: Grass Along the Bitterroot ... 259–260
ROTH, BERNHARD, A.—
Face of Rhode Island a Dozen Years Hence. With Robert E. Laramy ... 226–227
Soil Survey Help Urban Planners ... 150–151
RUFFNER, JOSEPH D.: New Plants for Strip Mine Spoils and Shole Soils ... 209–210
Rural—
America (Wis.). Cover picture ... [122]
Areas Development—
affected by White Tanks and McMicken dams (Ariz.) ... 126–127
At Its Best in Virginia. Lester Fox ... 124–125
effectiveness brought about by Six-Mile Creek project (Ark.) ... 135
goal is more jobs in rural America ... 131
helped by Big Blue Creek project (Ill.) ... 130–131
helped by Salem Fork Project (W. Va.) ... 140–141
New Tool for Community Improvement. John A. Baker ... 132–134
selects Sherman Co. for improvement (Nebr.) ... 142
Through Soil and Water Conservation. Donald A. Williams ... 123
Areas Improvement, Only a Stone's Throw To. Joseph Bornstein ... 139
Electrificational Administration helps locally in RAD (Ark.) ... 135
Rurban, a Problem, Georgians Meet Head On. Sellers G. Archer ... 154–155
Rurbanization—
A Major Conservation Challenge. Donald A. Williams ... 147
See Urbanization
Ryan, Edmund S., conservation plan is field guide ... 175
RYERSON, GERALD E.: Plows To Fit the Land—Land To Fit the Plows ... 60–62
SANDERSON, WAYNE: One Hay Crop Pays for Conservation Improvement ... 54
SAULISBERRY, C.: Where Men Are Men SCD Program the Hard Way ... 116–117
Schuster, H. E., and Jack, reap benefits from GPCP (Tex.) ... 78
SCHWEERS, MARVIN L.: Milwaukee Schools Go All Out for Conservation Teaching ... 278–279
Scott, J. Lewis, and Mrs., interest excludes community conservation projects (Pa.) ... 157
SEDGLEY, ELLIS F.: District Profile, Don Hill of Colorado ... 107
Seed: The Yearbook of Agriculture: Review by A. D. Stoesz ... 47–48
Selke, George A., says that nonfarm people must understand their own stake on conservation ... 288
75,000 Minnows an Acre. James R. Cox ... 8–9
Sevier River (Utah), progress in 1961 ... 163
Shoemaker, Bob, decides partnership would benefit under GPCP (Colo.) ... 86
SIMMS, D. HARPER.: Review of Our National Park Policy ... 192
Simpson, John H., GPCP takes gamble out of ranching (Wyo.) ... 79
SISK, LEON J.: Star Farmer of America Schooled in Conservation ... 269–270
Sisson, Merle, designed post peeler (Wyo.) ... 70
Small Private Forest in the United States. Reviewed by T. B. Plair ... 143

SMITH, GEORGE R.: Man KO's Gully in Three Rounds. With Grant Woodward — Page 9–10

SMITH, GORDON S.—
Community Action in West Virginia Brings Multiple Area Benefits — 140–141
New Uses for Old Farms — 177–178
Puts Seep Water To Work All Around the House — 159

SMITH, JAMES E.: Something Different on the Plains — 207–208

Snow survey(s)—
forecast stations in 11 States — 19
made by SCS (Idaho). Cover Picture — [97]

Soil(s)—
A City Looks To. Harold E. Grogger — 233–234
and Water Conservation Basic To Outdoor Preservation. Donald A. Williams — 171
and Water Problems for Two Centuries. Donald A. Williams — 243
and Water Research Spans a Century. Carl W. Carlson — 257–258
classification and correlation in 1961 — 164
classification began to be developed — 257
Compaction, Cropland, Cutting Down on. A. W. Cooper — 31–32
Conditions and Plant Growth. A review by B. D. Blakely — 48
conservation begins with plants — 195
erosion investigations authorized in 1929 — 259
Evaporation Is a Major Loss. Omer J. Kelley — 14–16
loss prediction for wind erosion areas, 1961 — 165–166
management—
as key words — 27
Boosts Wildlife. E. R. Minnich — 41
Our, and Their. Review by P. H. Montgomery — 96
Principles for Conservation of Cropland. R. D. Blakely. Picture story — 36–37
moisture measurements made by atomic radiation — 258
physics came into its own — 258
Stewardship, A Half-Century of, By This Wisconsin Family. Gerald W. Easton — 248–249
texture recognized as important to plant growth — 257

Soil Conservation District(s)—
Act, Womenfolk Get In On. Lemar R. Mason — 103–104
Alpine bought ditch-lining equipment (Utah) — 229
Antelope Valley Nursery grows trees (Calif.) — 202
begin communitywide conservation approach — 123
Brings More Business—Better Community Life, Machinery Dealer Finds. Harry W. Archer — 118–119
changed face of Southeast — 245
Chesterfield (S.C.) helps with camp program — 174
Frontier County, furnishes sprayer and crew to apply herbicides (Nebr.) — 46
furnishes milo seed for wildlife — 41
helped sponsor Big Blue Creek project (Ill.) — 131
helps lay out wheatland strips (S. Dak.) — 33

Soil Conservation District(s)—Continued — Page
In Action. William E. Richards — 108–109
Leader, What a Typical Does—Gratis. Leon J. McDonald — 101
Meet Community Needs. Donald A. Williams — 99
operate Oakes and Ft. Lincoln nurseries — 197–198
Plan Means College for Michigan Youngsters: Wendell Somers — 111–112
Program, Owner-Renters and Landlords, All Profit From. Charles A. Holden, Jr. — 112–113
Program the Hard Way. C. Saulisberry — 116–117
Programs Mean Better Hunting-Fishing. George L. Jessup and Charles L. Limeberry — 113–115
Programs Work for the Farmer. Roy B. Brower — 100–101
progress report, 1961 — 162
Seven-Eight and Eloy leveled land, installed ditches (Ariz.) — 4
starts "big brother" wildlife movement — 113
watershed project assistance (Ark.) — 135
West Fork co-sponsored watershed project — 140

Soil Conservation Service—
assistance—
ACP, progress in 1961 — 167
Conservation Reserve Program, in 1961 — 161
Farmers Home Administration, in 1961 — 167
Rural Areas Development in 1961 — 167
assisting Dunn County District (N. Dak.) — 23
assists Kansas farmers on grass waterways — 13
checked Lake Apopka area (Fla.) — 21
deals with soil and water conservation — 3
helped in developing water (Calif.) — 16
helps soil conservation districts (Ariz.) — 4

Soil Survey(s)—
being put to practical use (R.I.) — 226
data supplied basic data for Conservation Needs Inventory — 220
dependable sources for water and sewage system (Mo.) — 234
for rurban land development (Mich.) — 235
Help Urban Planners. Bernhard A. Roth — 150–151
interpretation in 1961 — 164
investigation in 1961 — 164–165
necessary in rurban sections (Va.) — 153
operation in 1961 — 164
progress report, 1961 — 164–165
results unique in Conservation Needs Inventory — 219
revealed Springfield occupies land suitable for cropland (Mo.) — 233
used in selecting land (Ohio) — 284

SOMERS, WENDELL: SCD Plan Means College for Michigan Youngsters — 111–112

South Carolina—
inventory presented to Gov. Hollings — 232
mulch tillage practiced — 39
river basin development speeded by Needs Inv — 239
shifts in land use — 245
State camp program coordinated — 174

South Dakota— Page
Conserves rain and snow water 6
F. E. DuBose, District Profile 24
Earth Moved in Year Would Build 30 Mile Dam. C. D. Brehm 64–65
Garrison creeping foxtail for potholes and swampy areas 211
Great Plains conservation farmers survive drought 76
has high wheat yields 33–34
irrigated pastures yield more lamb and mutton 94
Springs for stockwater. Cover picture [2]
Starvaggie, Mike, restored strip-mine land 67
Sterner, David, denounces beaver trappers 189
STEPHANS, HAROLD V.: Big "C" Stands for Connally — Cattle — and Coastal Bermudagrass. With Frits Graeber 129–130
Stinson, L. E., says contour stripcropping prevents soil loss (Ky.) 223
Stockman, Paul, and Paul, Jr., tried wheel track planting 43
STOCKWELL, HOMER J.: Specialized Water Forecasts Promising 18–19
STOESZ, A. D.—
Review of Principles of Plant Breeding 215
Review of The Yearbook of Agriculture 47–48
Stripcropping—
Centennial. Glenn D. Garvey 255–256
of corn alternated with grass and small grain 59
Strip Mine Land Can Be Salvaged. Encil Brohard 66–67
Stubble Mulching—
for California's Hillside Fields. Adrien Kuffer 39–40
progress in 1961 166
SWENSON, R. S.: One Drop of Water Does Work of Two 4–5
Swenson, Roy S., responsible for conservation changeover in schools (Wis.) 278
SWENSON, W. S.: Colorado Tree Plantings Multiply Game and Song Birds 183–184

TAFF, HOMER A.: From Brush to Grass 88–89
Teacher Conservation Institutes Bring County People Together. David O. Davis 273–274
Teamwork Saves a Bridge. Leon J. McDonald 128
TEGNER, ROBERT F.: After a Century New Generation Takes Over 246–247
10 Million Young Conservationists. Shirley Miller 272–273
Tennessee—
farmer parlayed grubstake to a farm 269
schools use TV as an aid to conservation teaching 288
shifts in land use 245
Texas—
brush control paying off under GPCP 88
Bushland station used to study Zingg terrace system 90
district supervisors pledge teaching conservation in schools 275

Texas—Continued Page
farmers adapt machinery to their needs 58
GPCP ends wind erosion 78
Johnson City, springs for stockwater. Cover picture [2]
Lake Waco sediment yield reduced by conservation measures on watershed 260
legislation authorized creation of wind erosion conservation district 253
native and introduced grasses production expanded 207
soil conservation means more business 118–119
Southeast of San Antonio planted to coastal bermudagrass 129
Sulphur Creek watershed used for recreation 181
THACKER, O. WENDELL.: Irrigator Stays With His Farm 92
THATCHER, ALBERT P.: Conservation Takes Gamble Out of Wyoming Ranch Operation. With Brent J. Harrison 79–80
Thompson, Arland, and family, take part in ranching operations (Utah) 103
Tile—
line laid around house (N.H.) 159
Old, Farming History, in. M. M. Weaver and Marion G. Leiby 250–251
Tillage—
Minimum. Licks "Goose Drowners." Glen E. Bernath 43–44
Mulch, Stops Harvest-End Smoke Signals. W. Lee Colburn 38–39
quotation by Daniel Webster [50]
system for planting developed by Nebraska Univ 91
Tombigbee River (Ala. & Miss.) progress in 1961 163
TOPHOLM, AAGE S.: Nevada Land Responds To Grass Improvement 212–213
TOSSETT, OTIS: Trees for North Dakota's Future. With John McDermand 197–198
Trapping season again. Photographs (N.J.) 120
Tree(s)—
for North Dakota's Future. Otis Tossett and John McDermand 197–198
planting on strip-mine land (W. Va.) 67
plantings in treeless areas (Colo.) 183
Yule, For a Merry Christmas. John Hultgren 102–103
TURNER, JULIAN J.: Nation's First Small-Watershed Project Spurs Arizona Area's Economy 126–128

Ulrich, Ed, flood-plain land once flooded now producing (Ark.) 137
Upper Mississippi River and Great Lakes Basin Areas, progress in 1961 163
Upper Willamette and Deschutes River (Oreg.), progress in 1961 163
Urbanization—
brings expanding industrialization (Va.) 152
causes industry use less desirable sites (Pa.) 157
communities turn to soil scientists (Conn.) 150

Urbanization—Continued Page
in Cimarron (Kans.) 95
land needing conservation 161
octopus of (Calif.) 148
on farmlands. Cover picture (Pa.) [146]
See Rural, Rurban, Rurbanization, Soil Surveys
U.S. Office of Education works with SCS on conservation teaching materials 267
U.S. Study Commission authorized to study 8 major river basins 239
Utah—
Ogden, developing into a duck haven 176
womenfolk take part in ranching operations 103

Van Dyke, Howard, harvests 50 sacks of rice an acre (Calif.) 47
Varner, Jim, and Bob, illustrate landowner-operator, renter and landlord benefit from SCD (Kans.) 112
VOSCHIN, JOSEPH J.: You Can Depend on Orchards on the Level 45–46
Vermont—
contractor solves stone problem 139
Morrisville, electric power depends on wooded watershed conservation 190
SCD sponsors conservation cartoon project 281
water importance in findings of Needs Inv 237
Virginia—
crop yields vary with the soil 238
Culpeper, Mountain Run watershed project proves RAD at its best 124
Fairfax County Outstanding in Rurban Action. J. E. Beard 152–154
Institute works with contour stripcropping 59
Mountain Run watershed multiplies recreational space 182
shifts in land use 245
tobacco cultivation ruined some of her territory 251
Waynesboro, South River Watershed dam provides recreation 187
wildlife food and cover in omitted terrace channel row 41

WALLACE, MERVIN H.: Conservation Cropping System Works for Arizona Farmer. With Walter E. Parsons 34–35
Wannamaker, L. C., welcomes conservation campers (S.C.) 175
WARD, CARL R.: District Profile, Adolph Hansen of Colorado 67–68
WARNKEN, AUSTIN D.: California Farmers Have System for Meeting Conservation Needs 230
Washington—
area used for hunting after pasture and irrigation season 184
scene of Xmas tree farm 102
State Department of Game promoting wildlife-watering facilities 115
Sunnyside, circulating irrigation system 11
waterway now part of orchard 71

Washington—Continued Page
Yakima, elementary school studies conservation 272
Washington, George—
offsets crop failure by herring sale 173
Water—
and soil conservation 171
and soil research spans a century 257–258
Conservation—
Donald A. Williams 3
A Key to South Dakota Progress. Steve Korton 6–7
basic to outdoor preservation 171
begins with plants 195
research becoming established 258
Conserving Runoff, With Zingg Bench Terrace. Victor L. Hauser 90–91
Flood, No More for Cimarron. Gerald A. Riepl 95
For Illinois City and Farmers, Project Solves Problems. Kent Alverson 130–131
Forecasts, Specialized, Promising. Homer J. Stockwell 18–19
Is Gold. Homer W. Marion 16–17
Management Remakes Muck Pasture. C. F. Lind 21–22
One Drop of, Does Work of Two. R. S. Swenson 4–5
problem waste turned into asset (Wash.) 11
rights information furnished on Sevier River Basin (Utah) 19
Seep, Puts To Work All Around the House: Gordon S. Smith 159
soil, plant, and wildlife management established public policy 243
supply can attract new business (W. Va.) 141
supply forecasting in 1967 167
Waste, Problem, Turned into Asset. Oliver D. Jeffords 11
Waterspreading Puts More Raindrops to Work. Herbert I. Jones 22–23
Watershed(s)—
Big Blue Creek proj. solves water prob. (Ill.) 130–131
Green River maintains Lamoille River level for power (Vt.) 190
Lakes and Farm Ponds Boon to Recreation and Wildlife. Carl B. Brown 180–182
marker of first project in U.S., 1933 264
part inventory included all lands 222
pilot projects, progress, 1961 162
project—
aid to urbanization (Ga.) 154–155
By-Product, Youth Conservation Is. Sellers Archer 65
eliminates Cimarron floodwater plague 95
helps Culpeper area (Va.) 125
Nation's First, Small, Spurs Arizona Area's Economy. Julian J. Turner 126–128
projects demonstrated practicability of rural areas development 123
protection and flood prevention, progress report, 1961 162
protection, progress, 1961 162

Watershed(s)—Continued Page
Research for the Northeast Points Up Water Conservation Needs. Martin L. Johnson 237
Salem Fork project brought back progress 141
Six-Mile Creek project boosts economy 135–137
South River dam provides recreation area 187
treatment affected downstream flooding 258
Waterway, $1,000 Orchard, Is Paying Off. W. R. Fibich 71
WEAVER, M. M.: Farming History in Old Tile. With Marion G. Leiby 250–251
Webster, Daniel. Quotation on tillage [50]
Weed Control. As a Science. Review by Frank Edminster 215–216
Weedlich, Henry, worked out conservation farm plan for Templeton Colony (Mass.) 106
Weisbrod, Carl, combines fishing and waterfowl hunting with multiple land use (Wash.) 184
"We Pledge Ourselves." John C. Beard 275
Welch, J. Frank, talks about GPCP at Great Plains Agricultural Council Meeting 83
West Ditch Irrigation Company of Rockland provides water for cropland (Idaho) 17
West Virginia—
area strip mine spoils solved by conservation 209–210
community puts flash floods in past 140
Harrison County, old rail fences and soil conservation. Cover picture [242]
revegetation has been done on strip mine land 66
small farms revived for outdoor living sites 177
strip mining results in bare slopes 209
White, John, would not plant without using land leveler (Maine) 53
WILBERT, DON: Conservation Watershed Management Restores Creek Flow 186–187
Wilderness, America's Living Heritage. Reviewed by Lawrence V. Compton 192
Wildlife—
area used after pasture and irrigation season 184
beaver an upstream conservationist (Idaho) 188
"big brother" movement started (Calif.) 114
conservation—
central part of farm plan (N.H.) 263
important on farmland (Conn.) 175
on 10-acre tract (Utah) 176
developments exceed 6,000 (Nebr.) 214
food and cover in omitted terrace channel row 41
food and cover to be increased by rurban landowners (Pa.) 157
inventoried 222
planting on 6 farms (N. Dak.) 179
plantings selected for game birds and animals 178
see Recreatio, Rural, Rurbanization, Urbanization
significant role in Rhode Island's future 227
studied in classroom (Kans.) 286
supplies bullfrogs and ducks (Oreg.) 191
tree planting in treeless area (Colo.) 183
Wilkensen, Marvin, slogan is "feed em" and reap (S. Dak.) 94
WILLIAMS, DONALD A.— Page
Conservation Education in the Classroom and Afield 267
Cropland Conservation 27
Great Plains Conservation Program 75
Plant Materials Basic To Soil and Water Conservation 195
Rural Areas Development Through Soil and Water Conservation 123
Rurbanization a Major Conservation Challenge 147
Soil and Water Conservation Basic To Outdoor Preservation 171
Soil and Water Problems Concern for Two Centuries 243
Soil Conservation Districts Meet Community Needs 99
Technology and Machines Speed Conservation 51
Water Conservation 3
WILLIAMS, GENE L.: Tame Pasture Works for Father-Son Team. With Donavon E. Broberg 87
Williams, Ott, gives up town business for year-round summer home (La.) 181
WILLIAMS, ROBERT E.: Review of the Plant Community 119
Windbreak plantations receive timely weeding 46
Windbreaks, Mojave Desert. Harold Loudermilk 202
Wind erosion—
project established near Dalhert, Tex., 1934 252
study started, 1947 258
WINN, D. S.: Room for Outdoor Development Demonstrated in West 176–177
Wisconsin—
Beloit, settled by Dougan family 248
Grant County, students learn about conservation farming. Cover picture [266]
LaCrosse, Upper Mississippi Valley, Experiment Station established 255
Milwaukee school children exposed to conservation education 278
Monroe County, good conservation practice. Cover picture [26]
rural America. Cover picture [122]
St. Germain Lake shows aging process from people 172
Shows How Needs Reports Can Be Used. Edwin Hill 224–225
Wittmeyer, E. C., reports mulching does better job 40
Woodland(s)—
conservation central part of farm plan (N.H.) 263
conservation in soil survey reports, progress in 1961 166
estimated by Needs Inventory to decrease 1½ percent (R. I.) 227
needs improvement according to Needs Inv 222
WOODARD, JAMES L.: Kids' Cartoons Liven Conservation Interest. With Louis J. Dondero 281–282

WOODWARD, GRANT: Man K.O.'s Gully in Three Rounds. With George R. Smith ..... Page 9–10

Wyoming—
- dry Johnson Creek becomes yearlong stream .. 186
- Garrison creeping foxtail for mountain meadows 113
- livestock growers credit timing of conservation in irrigated pastures 89
- rancher takes gamble out of ranch operation .. 79
- Sundance, post peeler used on pint post 69
- Teton County, intermediate wheatgrass. Cover picture ..... [194]

Yazoo-Mississippi River (Miss.) progress in 1961 ..... Page 163

Yield(s)—
- from proper soil management (Mich.) 29–30
- Gets High Wheat, Water. W. N. Parmeter .. 33–34
- increase, through reduced evaporation in growing cotton, sorghum, and corn 15

"You Can't Level That Land" But Idaho Farmer Did. Eugene F. Crisman 62–63

YOUNG, GLADWIN. Review of Land of Plenty the American Farm Story 263

U.S. GOVERNMENT PRINTING OFFICE:1963